THE IRON AGE

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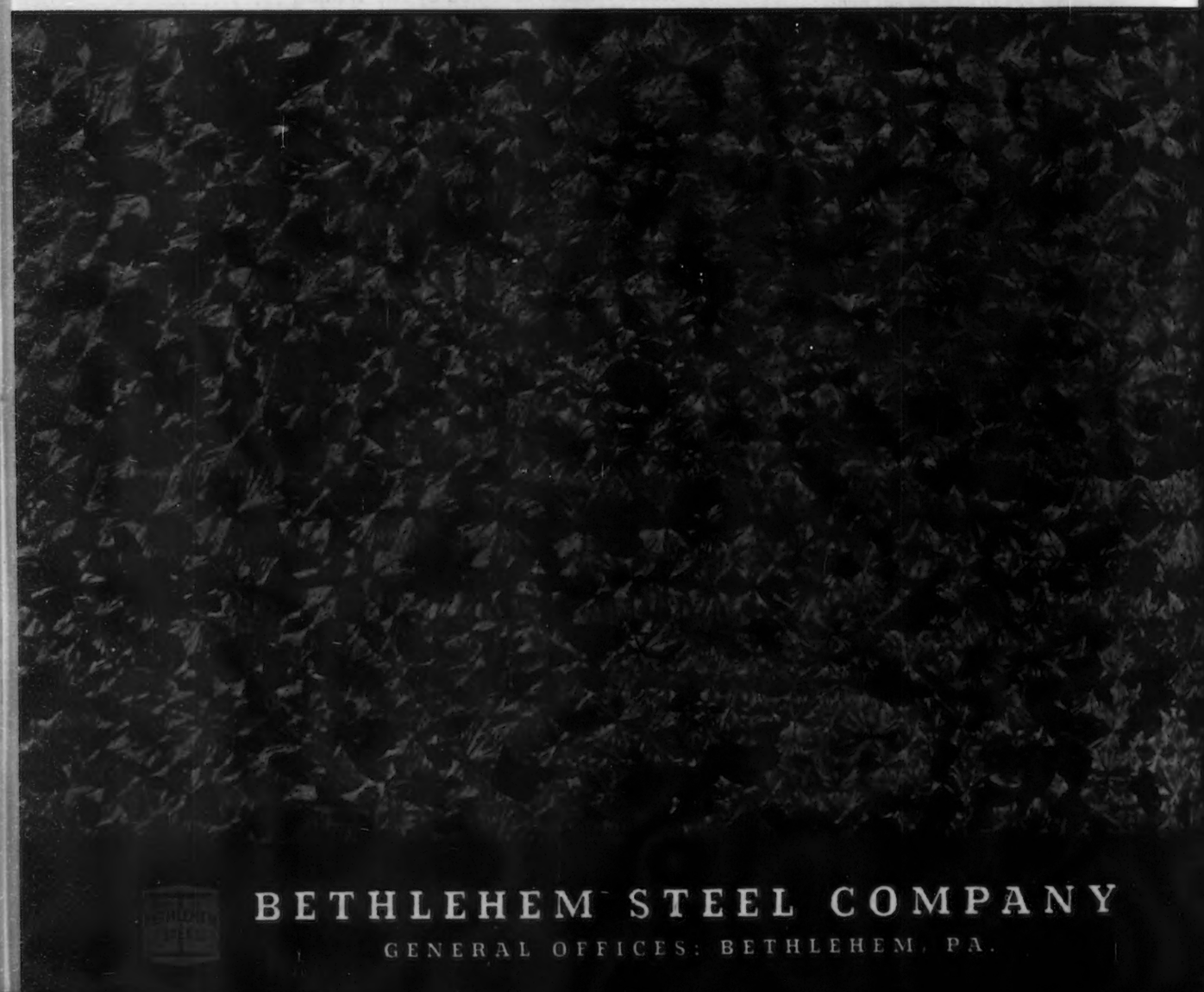

BETHLEHEM STEEL COMPANY

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▲▲▲ THE IRON AGE ▲▲▲

AUGUST 15, 1935

ESTABLISHED 1855

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Where Angels Fear to Tread

IT is no easy matter to plan and manage the affairs of a successful industrial organization. To coordinate the myriad of separate activities which involve selling a product, making it and showing a profit requires ability of a high order plus thorough commercial and technical training.

The details of managing a national economy are many thousands of times more complicated than are those of the largest industrial or business organization. No government has as yet succeeded in carrying out a "planned economy," for the simple reason that supermen of the requisite ability and experience to plan and manage these details have never existed and probably never will.

Successful governments, heretofore, have recognized these human limitations and have governed best by governing least.

Today the trend is in the other direction. Men who are devoid of managerial experience and who have been thrust into governing positions through the exigencies of mob or class appeal are attempting to centralize power to an extent undreamed of hitherto even by emperors and czars.

Such men are dangerous primarily because they are incapable of recognizing their own limitations. Their mistakes, made through lack of experience, poor judgment or bad advice, are not acknowledged as errors but are attributed to organized opposition by enemies of the people.

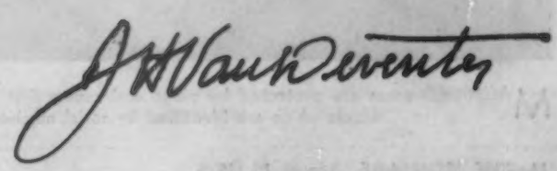
Thus in one instance the Jew becomes the target; in another, the thrifty.

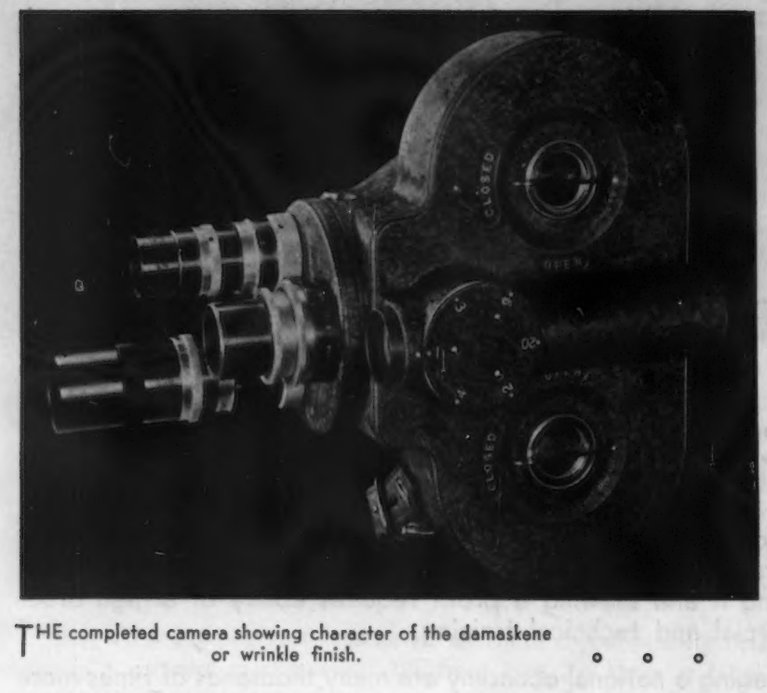
Amateurism will not work in the big business of managing a national economy any more than it will succeed in the smaller affairs of a private business. The reckoning may be delayed, but it is bound to come.

Even the most inexperienced layman, given dictatorial power, could not ruin General Motors or U. S. Steel overnight. But give him a free hand and enough blank checks and he would eventually put these giants on their backs.

Ex-housepainter Hitler and ex-schoolmaster Mussolini did not let lack of experience handicap them in their ambitions to assume detailed dictation of national economies, but the people of both nations, from present indications, will shortly have to pay the piper.

If America cannot be guided by past experience, perhaps it may be impressed by current happenings.





THE completed camera showing character of the damaskene or wrinkle finish.

o o o

▲▲▲ Finishing

o o o

By C. A. ZIEBARTH

Secretary and general superintendent
Bell & Howell Co., Chicago

o o o

WITH the advent of metal in camera construction the problem of coverings and finishes necessitated special study. The public had become accustomed to leather and leatherette coverings and it was necessary, from the sales point of view as well as that of service, to provide finishes that would meet all practical conditions, not alone as well as the older coverings but to give something that was actually superior.

It may be contended that after all a camera, either of the still or movie type, spends most of its time in a plush-lined case. However, it must be remembered that the camera accompanies people when they are at play. During the hours it is being handled the usage is rough, even abusive to the point of destructiveness. A satisfactory finish must be one that can be applied effectively to irregular surfaces. It should not be necessary to modify camera design to suit application of a finish or covering. It must withstand high and low humidity, heat and cold and an occasional ducking in a creek or pond. It should not be easily scarred or nicked. Particular attention is now being given to perspiration, inasmuch as it is known that perspiration of some people is definitely destructive to many kinds of finishes.

Sales appeal must not be overlooked. This is a problem of quality in shop practices, the judicial

MACHINED areas are protected by plugs and covers that are stored in wooden blocks which are identified by serial numbers.

A sand casting to which plugs

Motion Picture Cameras and Projectors

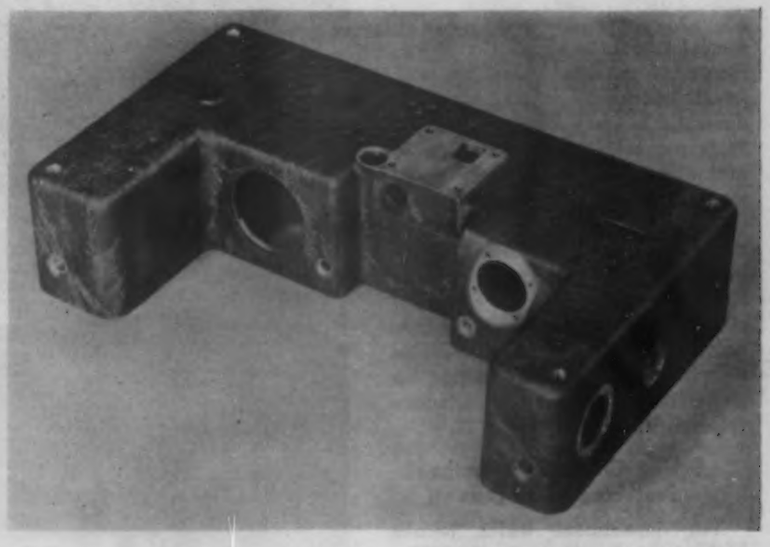
selection of colors or tints and a vigilant check on finishes on other articles, whether of like or dissimilar character. For instance, only a few years ago a number of camera manufacturers used a baked finish that was described by the word "crystal." It was a rough finish, desirable on a camera because of its partly non-reflecting characteristics and because the camera felt secure in one's hands. The public liked it only too well and in time that finish became so common, even on cheaply made goods of many descriptions, that it no longer belonged on high-class merchandise. Once again the hunt was started for a new finish.

Bell & Howell Co., Chicago, manufacturer of amateur and professional moving picture cameras, projectors and necessary appurtenances, broadly divides its products into two classes. Cameras and projectors fall into one classification. These products fall into both skilled and unskilled hands, and in the case of cameras abuse may be unusually severe. On the other hand, there is that class of equipment that is used in film work shops where all surfaces must be smooth and easily kept free of dust in order to reduce to a minimum the possibility of dust damage to wet film that is in process.

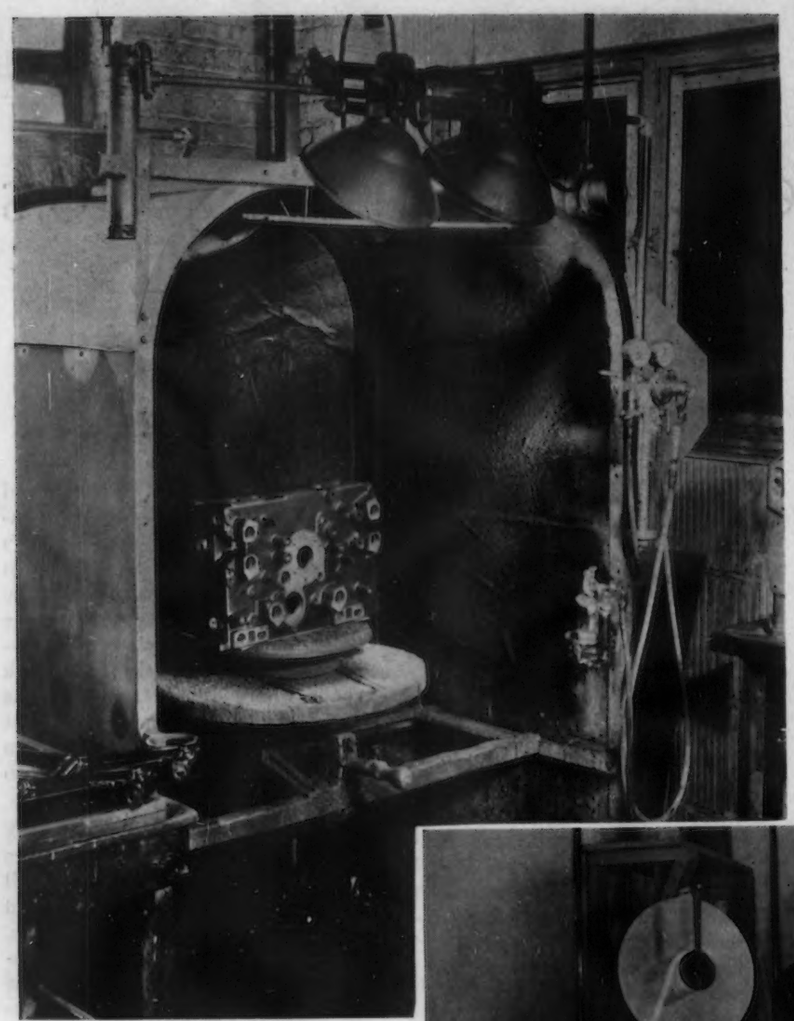
THE advent of metal finish instead of leather and leatherette coverings in the production of motion picture cameras and projectors has resulted in the perfection of methods of applying and baking metal coatings. In the Bell & Howell Co. plant an undercoat of heavy-body rubber-finish enamel is covered with a tung oil base enamel which produces a "damaskene" or wrinkle finish. Color effects are obtained by spraying the damaskene finish with lacquer. Plugs and covers are used to protect areas that are not to be covered by the enamel and lacquer.

Aluminum die castings and gray iron sand castings are the two products most commonly coated. All of these castings are normalized upon receipt from the foundry. They are slowly raised to a temperature of 450 deg. F., which is higher than any subsequent temperature reached in the coating processes. This precaution is necessary because it is absolutely es-

and covers have been fitted.



THE sand casting after having been sprayed and baked. Note clean surfaces that were protected.



SPRAY booths are well lighted and each one is ventilated by a suction system.

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sential to retain all of the refinements of machine practices and small tolerances which are fundamental in work of this character. It is not wholly impracticable to normalize, then coat and finally machine a part, but the finished part is more likely to have a better appearance if the finish is applied last. It at least eliminates the possibility of minor damage during processing in the shop. Another point is that machine operators complain of difficulty in setting up parts that have been coated before reaching them.

Baking Ovens and Booths Protected From Dust

The department which houses both baking ovens and spray booths is connected to the main shop by the necessary doors and window openings, the latter being covered with a coarse filter material so that air is cleaned of dust as it is drawn in from the main shop. The exhaust fan at each booth discharges through a short duct to the outside of the building. These rooms are actually under a slight vacuum. Once a week a vacuum cleaner is used to clean the air filters.

All castings, regardless of the material of which they are made, pass from final inspection after all machine work is completed to ovens where they are baked at 400 deg. F. This heat removes oil and moisture, and no further cleaning is necessary before applying the various finishes. Aluminum die castings, such as are used on cameras and projectors, are given

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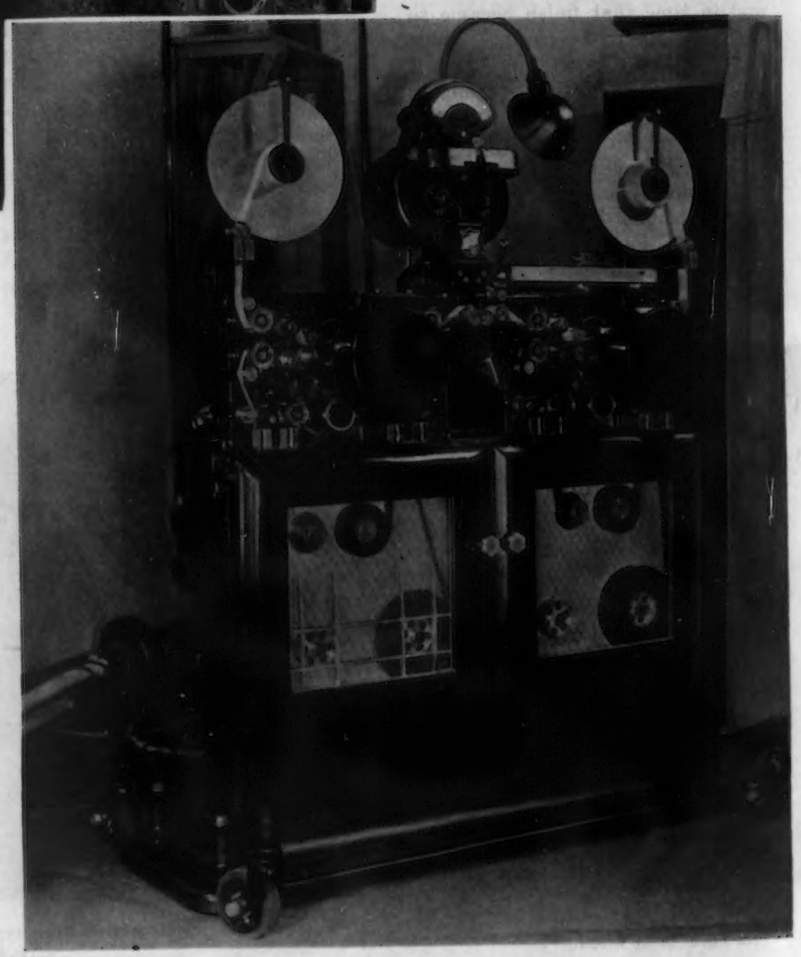


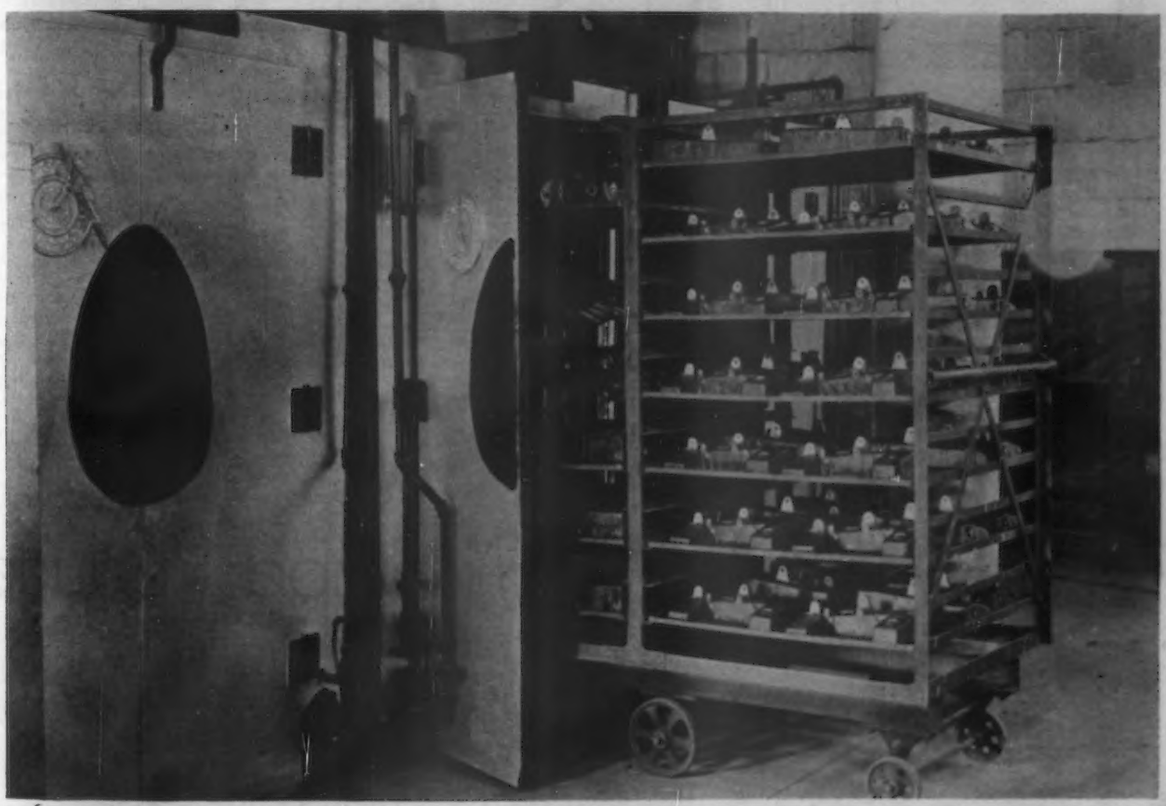
AN example of apparatus that requires a smooth finish. This is a fully automatic double printer as used in movie studios.

what is termed a "damaskene" or wrinkle finish.

Plugs and Covers Protect Parts That Are Not Sprayed

After the cleaning heat has been applied each casting is examined for slight imperfections such as snag and tool marks. When necessary these are filled and the castings are then taken to a bench in front of a spray booth. Practically every casting has machined areas that must not be sprayed. These areas, sometimes as numerous as 35 on a single casting, are protected by specially made plugs and covers. Many holes are so small that ordinary pins are used to plug them. Some round hole plugs are made of wood, and others are made of brass. Covers for flat machined areas are made of metal and are designed for snap fits so that they will stay in place. All plugs and covers are fitted with knobs for ease in placement and removal by the operator.

These plugs and covers having been designed for a specific part are always kept together by inserting them in holes in wooden blocks which are properly identified as to the part number. When a part comes into the finishing department it is necessary for the operator to call only for the plug block. When it is delivered to him, he has in that one block all the plugs and covers needed for the job at hand. When a large number of plugs have to be set before spraying, a helper is stationed at a spray booth. The one who does the actual spraying assists in placing and removing the plugs when necessary.



SPRAYED parts are assembled on trucks that are pushed into the ovens.

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Under Coat Is Rubber-Finish Enamel

All plugs being in place, the casting is placed in the spray booth and the under coat is applied. This is a heavy-body, rubber-finish enamel which is used primarily for its qualities of sticking to the metal. The period of air drying is of little consequence. The under coat having been sprayed on, all plugs and covers are removed and the casting is placed on a tray preparatory to the baking operation.

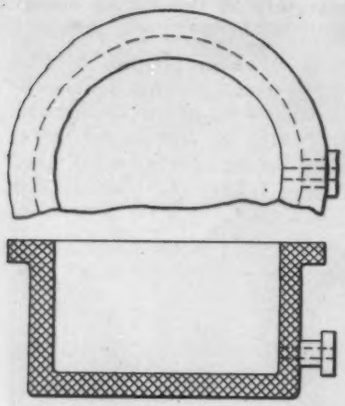
It is standard practice in this shop to start baking operations with cold ovens, slowly raising the temperature of the loaded oven, holding the heat for a stated time, and then letting the product cool in the oven.

When a load of the castings has been sprayed with the under coat it is placed in an oven, the temperature is brought up to 350 deg. F., which is held for one half hour, and then the oven is allowed to cool.

Covering Finish Has Tung Oil Base

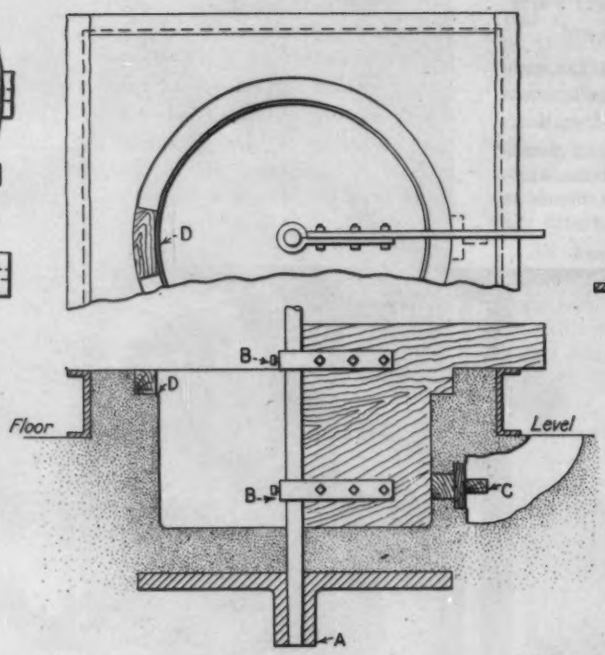
When the castings are cold, plugs are again fitted and the damaskene finish is sprayed on. This is a heavy body enamel, the base of which is tung oil, and which expands when placed in oven heat. Here again the air drying period is not important, so when an oven load of sprayed castings has been assembled, it is loaded in a cold oven which is slowly raised to 200 deg. F. and held at that temperature for 20 to 30 min. while the wrinkles are forming. At the end

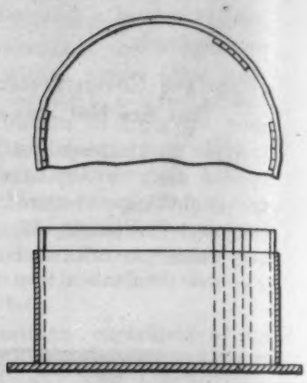
(CONTINUED ON PAGE 85)



ABOVE

FIG. 1—Denitrating tower lead saucer casting. The piece described is 30 in. in inside diameter and 18 in. in depth. The body and flange are 3 in. thick. After machining, the casting weighs 3670 lb.





ABOVE

FIG. 3—Pulley rim on cast plate with portion of lagging in place to assure correct diameter and depth of body core.

o o o

AT LEFT

FIG. 2—Lead saucer mold swept-up. Two arms were used on the comparatively shallow mold board to assure rigidity and accuracy when pulling the sweep around.

Change in Molding Method Reduces

o o o

By JOHN H. EASTHAM

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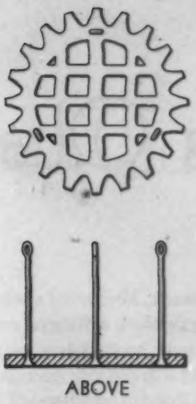
A CASTING of pan or saucer design, termed, on the order received from a company manufacturing explosives and chemicals: "Denitrating tower saucer casting; material, lead," is shown in Fig. 1. The usual blueprint giving dimensions and other specifications accompanied each order, but no pattern was furnished, possibly because, generally, when a request for two or three of these castings was placed the depth and diameter varied a little. The example chosen for descriptive purposes is 30 in. inside diameter, 18 in. deep, body and flange 3 in. thick, with a flanged outlet branch 2 in. in diameter of opening. The weight of the casting after machining is approximately 3670 lb.

The foundryman favored with all of this company's casting business—ferrous and non-ferrous—had for a considerable time swept the saucer molds up in loam, a method of production which, from the nature and extreme softness of the metal involved, left much to be desired. In the first place, the heavy contraction allowance of 5/16 in. per ft. made an easily yielding mold imperative, if cracking or tearing while cooling were to be avoided. Another difficulty hard to overcome in a closed loam mold was local shrinkage, heavy risers being of very little use, filling or "burning up" treatment after removal of the casting from the mold being invariably necessary.

The cost of carefully stripping the brickwork away from the castings, one brick at a time, was also prohibitive, but necessary in order to avoid bruising the face of the castings on account of the metal's extreme ductility. Briefly, when made in loam, there was not sufficient margin of profit in the job, particularly in the eyes of one observer, whose duty it became to alter matters, with the result that, after careful trial, the saucers were poured in opensand molds with satisfactory results, as hereinafter described.

Opensand Mold Procedure

A spindle socket-plate casting, as indicated at *A*, Fig. 2, was bedded level into a pit opened in the foundry floor, the upper face of the socket plate being set about 9 in. below the intended lowest point of the proposed mold. The spindle was then greased and lowered into the tapered socket, prior to attaching the mold sweep board to the metal arms shown at *BB*.



ABOVE

FIG. 4—Sprocket design of core arbor used on the lead saucer castings. Three-point lift facilitates handling when assembling.

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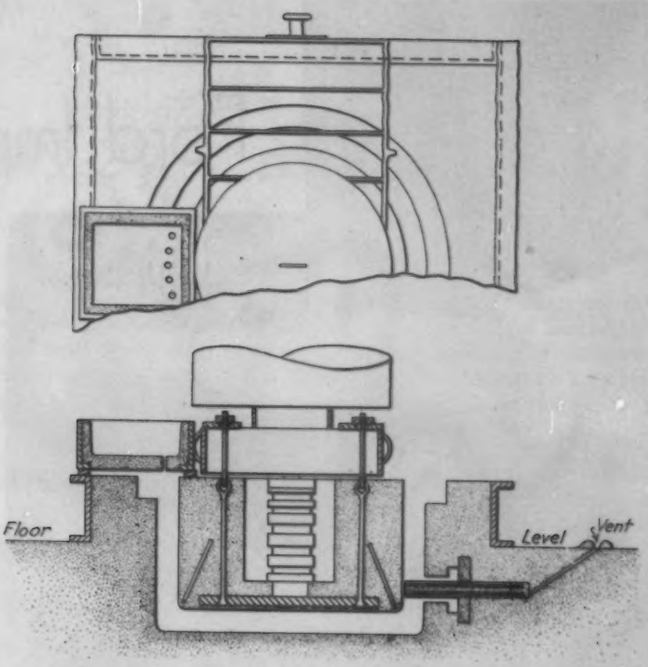
AT RIGHT

FIG. 5—Plan and sectional views of assembled mold for denitrating tower lead saucer.



Cost of Lead Saucer Castings ▲ ▲ ▲

A FOUNDRY regularly receiving orders for denitrating tower lead saucer castings had for a considerable time swept the saucer molds up in loam. Cost of production was lowered considerably, with more satisfactory margin of profit, by changing to opensand molds, as herein described.

Two arms were used on the comparatively shallow mold board to assure increased rigidity and accuracy when pulling the sweep around, as, due to the extreme fluidity and penetrating qualities of molten lead, a close, hard-rammed mold was necessary to counteract the tendency of the metal to "strike" through the sand when subjected to static pressure.

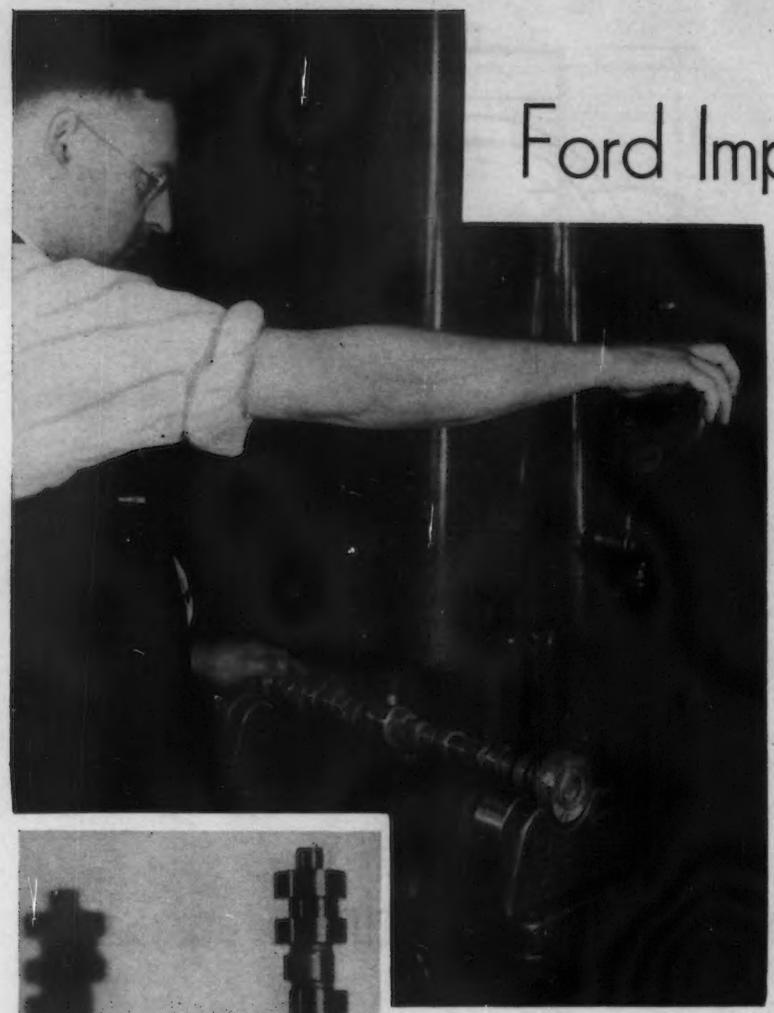
A tough facing sand consisting of new Albany molding sand and floor sand in about equal parts, stiffened with a little clay and commercial dry binder with a pitch base, gave added security when generously used on the entire mold surface during ramming and sweeping operations.

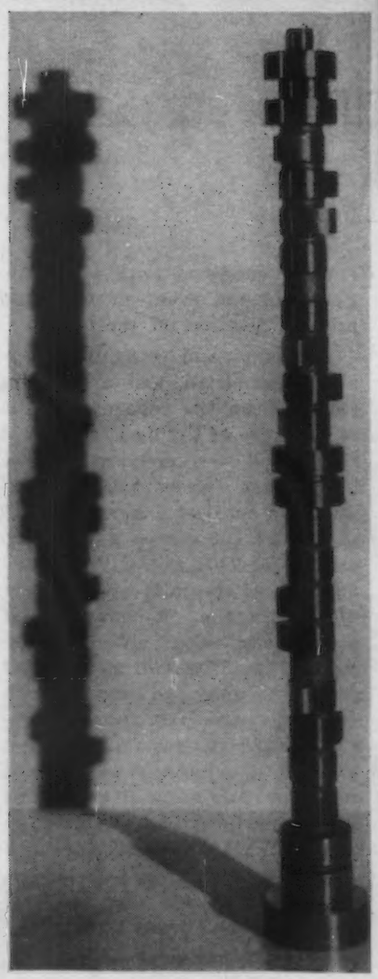
The outlet branch pattern shown at *C*, Fig. 2, was bedded in at the correct height before the floor level was reached, the outer face of its flange being left open as shown to permit the branch pattern to be drawn backward before finishing the mold and inserting the branch core when finally assembling the mold. From the floor level to the upper face of the main flange, a 12-in. by 4-ft. 6-in. cheek flask part accommodated the remainder of the mold, which, incidentally, was extended ¼ in. to allow extra metal when truing up the flange in the machine shop, a precaution of this kind being advisable when pouring opensand work as a safeguard in the event of the mold being a fraction off the level.

Sweeping and ramming operations completed, and a flat-joint slicked from the edge of the rim to the sides of the flask, the board and spindle were removed, the hole left by the spindle plugged, and the mold finished. A segment of the flange cut out on a bandsaw, as seen at *DD*, Fig. 2, facilitated finishing of the joint at the upper edge of the rim. A heavy coat of plumbago blacking rubbed into the mold by hand, as well as into that portion forming the outlet branch or nozzle after the pattern piece was withdrawn, was followed by a wash of a soluton of water and molasses, ratio about 10 to 1, prior to skin drying the whole area by means of a charcoal fire, under a sheet-iron cover. This milder, slower method was used in preference to the oil spray burner reg-

(CONTINUED ON PAGE 96)

Ford Improves Quality





ABOVE

ALL shafts are impact tested on this special machine.

AT LEFT

CASTING of camshafts has eliminated most of rough machining operations and heat treatment. Success of the cast camshaft depends on getting structure with cam tip hard (chilled) and center of shaft soft (machineable and strong).

o o o

NOTABLE savings in production costs and a marked improvement in the quality of the product have resulted from the manufacture of an alloy cast camshaft by the Ford Motor Co. for its V-eight cars and trucks. Approximately 6000 camshafts are made each working day at the Rouge plant by the new process, which was introduced about a year ago.

Most of the rough machining operations and the heat treatment of the camshaft, both of which were necessary when a forged camshaft was used, have been eliminated since the product has been cast in the Ford foundry. The main bearings of the cast camshaft now show a Brinell reading of 255 and the chilled cams 418. This means that the sturdiness of the camshaft in service, already more than ample to meet all conditions, has been further increased.

Perhaps the outstanding achievement technically has been the perfection of the foundry process of making the camshaft so that it has the desired hardness in certain places and desired machinability in other places when cast, thus doing away with heat treatment. Incidentally, the cast camshaft is of the same design as the forged shaft.

Success of the cast camshaft depends on getting a structure with the cam tip hard (chilled) and the center of the shaft soft (machinable and strong). As the shaft is cast in ordinary green sand molds, the depth of the chill and the strength and quality of the gray iron core is dependent on the analysis of the metal, the coke ratio, the pouring temperature and the amount of moisture in the sand.

Analysis of Mixture

The cast camshaft is of the following analysis: Carbon, 3.30 to 3.65 per cent; manganese, 0.15 to 0.35 per cent; silicon, 0.45 to 0.55 per cent; chromium, 0.00 to 0.25 per cent; copper, 2.50 to 3.00 per cent; and phosphorus, 0.05 per cent maximum.

Two standard cupolas are used to melt the charge, which is comprised of 320 lb. of Bessemer pig iron, 400 lb. of camshaft back stock, 80 lb. of steel scrap and 12 lb. of copper. The pouring temperature is 2600 to 2650 deg. F. The cupolas are lined down to 35 in., the coke bed being 36 in. high. Between each charge on an 8-hr. cycle 125 lb. of coke is added. On the fifth charge 50 extra pounds of

And Cuts Costs by Casting Camshafts

coke is used. A double charge of coke is added at 9.30 a. m. and another at 12.30 p. m. Air pressure in the cupola is 16 to 18 oz. Output is about 30 tons per cupola every 8 hr.

Hot metal is tapped from the cupola into 1200-lb. ladles suspended from an overhead monorail conveyor. An operator pulls the full ladle by hand to a point near the pouring station, where the metal is transferred to hand ladles to be poured into the molds. Two castings are produced in each mold. There is a core in the front end of each shaft for the undercut in the end of the shaft to aid in machining and grinding the face.

The mold conveyor is oval shaped. Castings are poured as the molds move slowly along this conveyor. Along one entire side of the conveyor a ventilating hood has

ABOVE

OPERATOR pulls a 1200-lb. ladle of hot metal on monorail conveyor to point near pouring station, where metal is transferred to hand ladles to be poured. Note inspector carefully checking heat.

AT LEFT

FORTY-ONE machining operations are necessary on cast camshaft, compared with 61 formerly on the forged camshaft. Here the main bearings are being rough ground on a centerless grinder.

been installed to draw off gases from the molds and the shafts. At the far end of the conveying unit is the shakeout. In the space between the shakeout and the pouring station is a battery of modern molding machines, where molds are prepared for the casting operation.

Samples of each heat are taken by pouring bars 1½ in. in diameter. After cooling, the bars are fractured and the depth of the chill is noted. If the chill appears inadequate, powdered ferrochrome up to 0.25 per cent is added in the ladle. On the other hand, if the chill in the test sample is too deep, small amounts of powdered ferrosilicon are added. An operator is constantly at work noting the fractures and adjusting the chrome and silicon contents to give the proper chill. A flat vent, 1/32 in. thick and as wide as the cam tip, is run up ½ in. from the point of the cam to start the chilling action on the No. 1 cam point, which is near a heavy section. Cams should be file hard on the tips.

All camshafts are impact tested by dropping a 3-lb. 8-oz. weight 30 in. on to the center main bearing, the shaft being supported during the test on the end main bearings. The test is so severe that it will break shafts with small cracks or shafts which are too brittle.

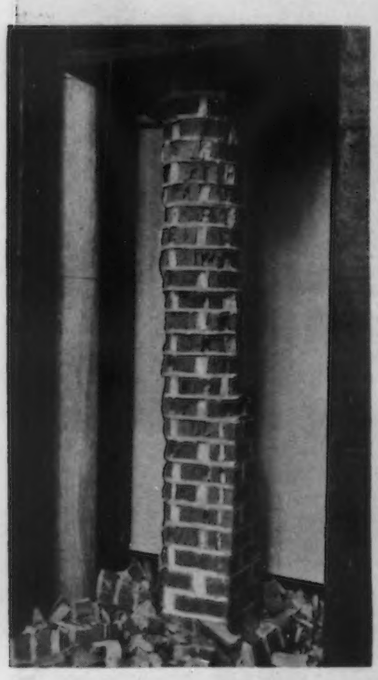
When the forged camshaft was used there were 61 machining operations on the rough forging. In connection with the present cast camshaft, only 48 machining operations are necessary. The only actual cutting operations are the machining of the construction slot, the cutting of the timing slot and making the centers for grinding the cams.

It is the white iron hard tips on the cams which are responsible for the maximum service given by the cast camshaft. Over 809,000 cast shafts now are in Ford V-eight cars in the hands of the public and no difficulty has been experienced in connection with them.

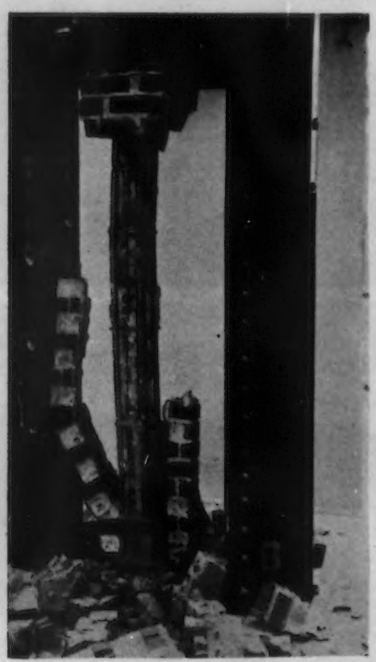
Lateral Steel Reinforcement Strengthens Brick Columns

A SERIES of tests recently conducted in the department of mechanics of the University of Wisconsin determined the properties of reinforced brick masonry columns and the results are considered of great importance to the building industry. The tests showed that the effective strength of a reinforced brick masonry column equals the sum of three components: the strength of the plain masonry, the strength of the longitudinal steel at its yielding point and the lateral restraint given by steel hoops placed in the horizontal joints of a brick column.

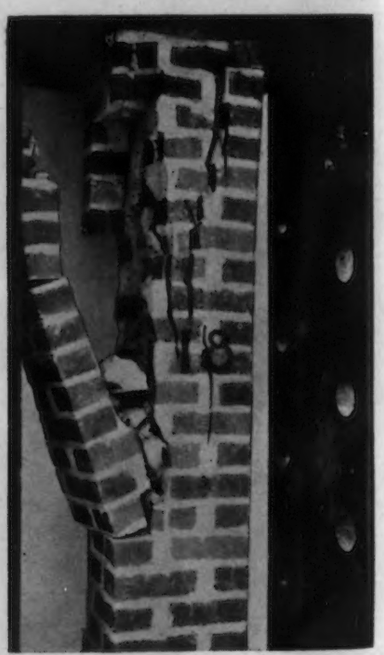
Lateral hoops in every joint served to increase the toughness and to some extent the strengths of the columns. The yield point of the ⅜-in. steel rounds used in the hoops was 53,800 lb. per sq. in. The strength of the fillet and spot welds in the 10-in. hoops after heating to 900 deg. C. (1652 deg. F.) and straightening while hot averaged 58,900 lb. per sq. in. of bar cross-section. Spot welds alone did not prove satisfactory.



THE strongest column of brick tested. Steel hoops placed in the horizontal joints added to the column strength. A maximum load of 768,700 lb. was applied before the column failed.



THIS reinforced column had no lateral hoops.



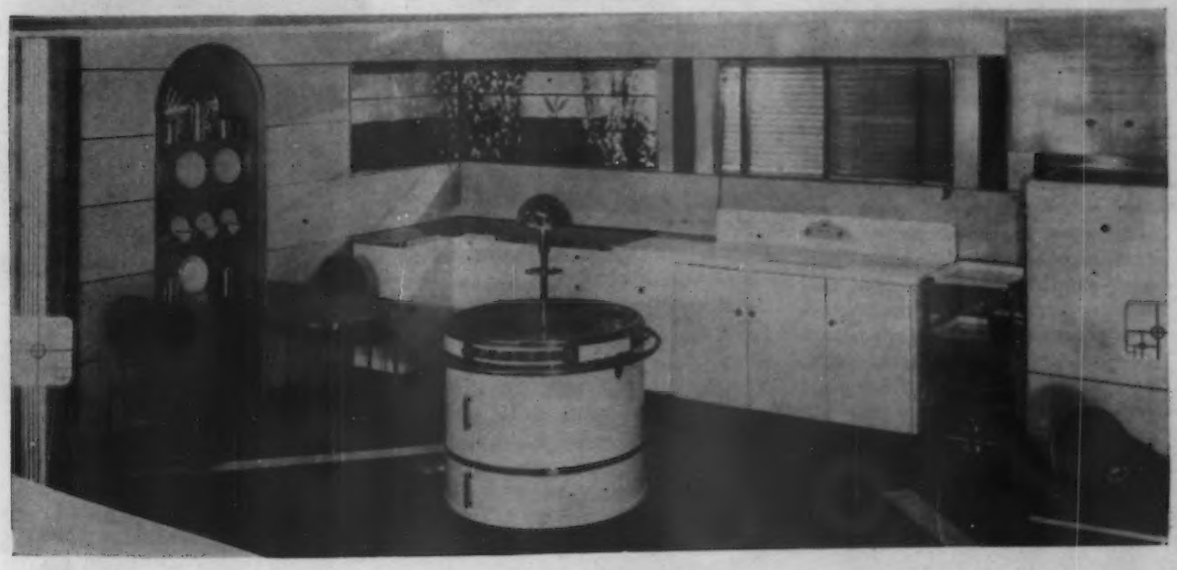
THIS brick masonry column had no reinforcement.

Model Kitchen By Briggs

THE steel plumbing division of the Briggs Mfg. Co., Detroit, which is just getting into production in the company's completely rehabilitated Hamtramck plant, exhibited in Chicago recently the model kitchen shown in this photograph. The kitchen cabinet sink is an example of drawn metal construction which has started a new trend in plumbing style and utility. Sinks are available in any color or color combination desired; the enamel is acid resisting. The small unit at the left of the sink is a dish-washing machine developed by Briggs. At the right of the sink is the new styling of a refrigerator by Briggs. In the foreground is a round electric stove created by Briggs engineers as a suggestion to the industry. The stove rolls on castors and permits cooking from any angle. The new drawn-metal plumbing ware and stove proved to be the outstanding sensation of the national plumbing show, more than 40,000 persons having seen the exhibits.

Briggs likewise displayed a model bathroom at the plumbing show, with all the plumbing ware, including the bath tub, made of stamped steel.

The new plumbing ware is streamlined and ultra-modernistic in every detail. Building stylists believe that this new mode in styling will provide an important appeal and stimulus in reviving activity in replacements and in the construction industry.



Flexibility and Economy Achieved in N

By F. L. PRENTISS
Cleveland Resident Editor, The Iron Age

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THE rehabilitation of a conventional manually operated sheet plant into a mechanized and modernized as well as a highly flexible plant, has been accomplished by the Niles Rolling Mill Co., Niles, Ohio, which has converted the old Falcon plant in that city into a high-production, low-cost plant for the manufacture of sheet specialties. The provision of a plant that will produce material of the highest quality has been one of the aims of the company.

Outstanding among the new equipment installed is a three-high roughing mill of a new type, which is another indication of a recent trend toward three-high roughing mills. Another feature is the two-high finishing mills which are fully automatic controlled, with mechanical tables, continuous polishers, etc.

Plant Completely Modernized

Adopting the view firmly held by many that there is still a place in the sheet steel industry for mills that by mechanization can reduce their costs so that they can compete successfully with large four-high continuous mills, and that many orders are not large enough to roll economically on a continuous mill, the Niles company developed its plans to revamp its plant with the most modern types of mills, mechanical feeders and catchers' tables, furnaces, conveyors, annealing, continuous pack shears and other equipment in order to improve the quality of the product and to effect a saving in labor costs. This plant, last operated by the former Empire Steel Corpn., was a modern full-finished, auto body, manually-operated plant at the time it was shut down in 1931. The Niles Rolling Mill Co. purchased this plant and has converted it into an up-to-date mechanized plant by the expenditure of nearly $500,000 in new equipment.

Enameling, long terne, galvanized and other coated sheets will be the specialties made in the re-equipped plant, which was placed in operation the middle of July. However, the products will include a full range of sheet finishes and widths up to 72 in. wide and from 16 to 30 gages.

The three-high roughing mill was installed as a substitute for the conventional two-high mill in order to effect economies by taking heavier reductions, to get more uniform gage and quality, and to increase production. This mill will use a sheet bar 16 in. wide as compared with the usual 12-in. bar, and the management expects to be able to increase this to a 24-in. bar and has hopes of cutting down the number of passes necessary for a breakdown from five to three.

No Backtracking

Material travels in one direction in the new layout, thus avoiding backtracking, while ease in changing from one product to another adds to flexibility. One or all of the finishing mills may be conveniently operated at one time.

Practically all the old hot mills, consisting of 10 roughing and eight finishing mills, have been scrapped and replaced by two finishing mills, one combination finishing and roughing mill and one three-high roughing mill which will produce 5000 tons per month. While three of the four mills were rebuilt, little from the old mills was used except the housings.

Roughing Mill Is Three-High Unit

The three-high breakdown unit is a 56-in. mill capable of roughing four pairs of sheet bar per minute. Two bars are broken down at a time, being first given two single passes and then three matching

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The three-high roughing mill has ...lly balanc

d n Modernization of Niles Sheet Mill

passes. A 16-in. wide sheet bar is reduced by five passes to a No. 16 gage breakdown or the desired thickness for the finishing mill. Operations are based on a 16-sec. cycle from the start of the cycle of the five passes to the beginning of the next. The roughing mill and also the three finishing mills are driven by a 1600-hp. General Electric motor at 30 r.p.m. and the sequence of operations of the mill. The front and back tables, the screwdown and the furnace conveyors are synchronized on the basis of the motor speed.

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has lly balanced top and middle rolls

The mill and its tables were built by the Continental Roll & Steel Foundry Co., Pittsburgh and Chicago. The mill has fully balanced top and middle rolls and is said to be the first fully balanced three-high roughing mill to be installed in the United States.

The top and bottom rolls are driven and the center roll is a floating roll. The top roll is balanced by a spring suspension and the center roll by mechanical mechanism. This middle roll is raised and lowered by a motor-operated eccentric which actuates four rods located along the inner posts of the mill housing, one at each corner.

Rolls Balanced to Prevent Slippage

Balancing of the two rolls, it is claimed, will prevent slippage and spalling of the center roll and assures better control than the friction driven three-high mill. It is also claimed that with the top roll driven, a heavier draft can be taken on the back pass than with a friction-driven mill. Being a wet mill, it is pointed out that the shape of the bar can be better controlled than on the ordinary two-high mill. The mill is expected to make 45 to 50 per cent reduction of the sheet bar on both the top and bottom pass with no slippage. A production of 1700 to 1800 pairs in an 8-hr. shift, or approximately 80 tons, is expected on this mill.

The top and bottom rolls of the three-high mill are 32 in. in diameter with 56-in. face. The roll neck diameter is 24 in. The working or center roll is 20 in. in diameter by 58-in. face and has 12-in. diameter roll neck. Bearings for the top and bottom rolls are Ryertex water type. Anti-friction bearings are used on the middle roll.

Clark-Type Screwdown Control

The screwdown drive consists of two motors, one for each screw, coupled together. The screwdown control, which is of the Clark type, is semi-automatic and is, it is stated, the first installation of this type of screwdown control in the United States. The control permits the taking of three, five or seven passes through the mill. Control of the mills, tables, furnace conveyors and screwdown is by two operators, one located at each side of the mill. The control equipment was supplied by the Clark Controller Co., Cleveland.

The roughing unit has a stationary table in front and a tilting, air-cushioned back table, and the speed of the tables, as previously stated, is synchronized with the mill speed. The mill and tables are so interlocked that a pass can not enter the mill unless the back or catching table is in its proper position and the position of the center roll is controlled by the position of the back table.

Bar-Heating Furnace Has Capacity of 12 Tons an Hour

The bar-heating furnace, which is natural-gas fired, is 90 ft. long and has the capacity for heating 12 tons per hour. This furnace and also the pack-heating furnaces are of the Flinn & Dreffein type and were built by Wean Engineering Co., Warren, Ohio. Bars are stacked in crates at the bar shear and carried by an overhead crane to a Mathews Conveyor Co. gravity conveyor extending along the side of the furnace, on which they move to the charging end of the furnace. Another gravity conveyor in front of the furnace moves the bars to the point where

they are picked up by the furnace conveyor chain.

Emerging from the furnace, conveyors carry the bars to the stationary table in front of the roughing mill, and after the mill makes complete cycle of passes the breakdowns are delivered on another conveyor to the charging end of the finishing furnaces.

Automatic Mechanical Feeders and Catchers Serve Finishing Mills

The two finishing mills are served by automatic mechanical feeder and catcher tables built by the Wean Engineering Co., Warren, Ohio. If the steel is doubled, it goes to a doubler on the catcher side of the finishing mill and is returned to the charging end of the pack furnace on a roller conveyor that, starting beneath the floor in front of the doubler, extends along the side of the pack furnaces and carries the sheet back to the charging platform for a second passage through the furnace and again to the finishing mill. The pack furnaces are of the chain type, 80 ft. long, with a capacity of 10 tons per hour each for single heating, or 5 tons for double heating.

The third mill in the finishing department is a manually-operated roughing and finishing mill for starting with the sheet bar and rolling material in 18 gage and heavier that is finished in one heating. This is served by a continuous bar and pack furnace. The two finishing mills and combination mill have been equipped with continuous polishers.

The cold-rolling equipment consists of three separate drives with a total of 11 mills.

Packs are sheared on a Streine pack shear made by the Streine

(CONTINUED ON PAGE 98)

AT LEFT

THE finishing mills are served by automatic mechanical feeder and catcher tables.

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BELOW

BARS are stacked in crates at the bar shear and are then transferred by overhead crane to a conveyor which moves them to the charging end of the furnace. Here another conveyor moves the bars to a point where they are picked up by the conveyor chain of the bar heating furnace.

Trailer Frames Fabricated By Arc Welding

INCREASED strength and lighter weight, together with savings in cost, are said to result from the use of welded steel construction in the manufacture of trailers by the Available Truck Co., Chicago.

Three sizes of trailers, namely 6, 8 and 10 ton, are built by the company. Standard frame lengths are 16, 18 and 20 ft. respectively, but other lengths are available. Frames of all models are 42 in. wide and 8 in. deep at rear and 5 in. deep in front.

Standard mild steel shapes are used wherever possible in construction of the trailers. The frames consist of two longitudinal members and six cross members. Spring brackets are of bar steel electrically welded.

The main longitudinal members range in length between 16 and 26 ft., depending on the size of the trailer. These members are 2½ in. wide on all models, with thickness of 3/16 in., ¼ in. and 5/16 in. respectively, for the 6, 8 and 10-ton types.

Cross members are 41⅝, 41½ and 41⅜ in. long respectively. Widths are 2½ in. in each case. The thickness of cross members is the same as that of the longitudinal members.

Construction of these trailers is extremely simple, consisting merely of assembling the frame channels, squaring them up and clamping in place. A sufficient number of clamps and spacers are used in order to assure correct dimensions and proper alinement. With the various members clamped in position, they are tack welded together at various points. (See Fig. 1.) The clamps are then removed and the whole frame welded into one rigid piece of steel, as shown below. Shielded arc equipment supplied by the Lincoln Electric Co., Cleveland, is employed in the welding.

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FIG. 1—Welding a trailer frame in the plant of the Available Truck Co., showing clamps used for holding structural members together.

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FIG. 2—A completed frame constructed entirely by shielded arc welding. Increase in strength, with a saving in weight, was obtained.

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Copperheads or Iron Oxide Defects In

A CONSIDERABLE number of articles have been written about the copperhead defects which occur at times in porcelain enamel. Most of these articles have been based on a few plant experiences and the control methods which are given are those which prevented the defect in certain plants. So many different things have been proposed for a cure that the information is confusing unless the fundamental aspects of such defects are kept clearly in the foreground.

It is hoped that this discussion will tend to clarify some of the previously published work through presentation of the fundamental considerations which account for the formation of copperheads. To some, this presentation of the mechanism may not be new, but there appears to be no recorded discussion of the mechanism which is supported by a microscopic study. Thus this discussion is offered in order to give an understanding of the fundamentals of copperheading.

Copperheads are so-called on account of the bronze or copper color which often exists in these defects. Crystals of iron oxide have been identified as the cause of bronze or copper color. Not all copperheads are of this color, but many of them may appear as gray iron oxide spots with free scale in the center or nearly covered with enamel. Thus copperheads may be defined as those defects in enamel which are caused by local spots of excess iron oxide. They are the spots which show iron oxide either as gray material which has never dissolved or bronze colored spots which result from crystallization of iron oxide from enamel. There occur, of course, all degrees of oxidation from little or none to excessive amounts, and thus there may be all degrees of copperheading defects.

FIG. 1. — Underfired ground coat enamel. The light area is the metal and the dark area is enamel. Note the undissolved iron oxide at the juncture. Taken at 500 diameters.

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At this point it would be well to give a description of the normal firing conditions of enamel in order to clearly understand the formation of copperheads on a sheet. In the regular or normal enamel ground coat firing process, there occurs an oxidation of the surface of the sheet in a layer, the thickness of which is of a few ten thousandths of an inch. It is influenced by such things as particle size of the enamel, thickness of coat, duration of time of the enamel ware in the temperature range below the fusion range of the enamel or the time that the metal is exposed to the oxidizing atmosphere of the furnace as well as the nature of the metal itself.

It is quite well known that the dried ground coat, on the iron before fusion, exists as a layer made up of various sizes of jagged glass particles packed together. During the first short heating interval, moisture and gases are liberated. This moisture was not freed by the previous drying because of chemical combination. As a result the film of enamel cracks much the same as a clay bed on drying and the shrinkage will crack. The gas evolved also forms openings.

Oxidation Proceeds Until Enamel Fuses

A ground coated panel which has been fired fairly hard at one end and no fire at other will show all stages of burning. Thus the appearance at various stages of fir-

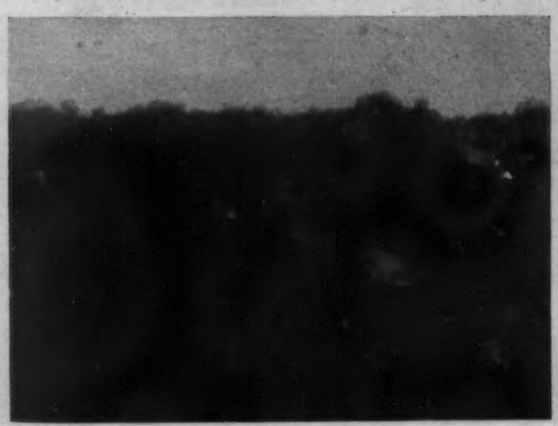

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FIG. 2.—Underfired ground coat enamel at 500 diameters. Note the bubbles in the enamel. There is still some undissolved oxide at the interface.

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In Porcelain Enamel

By J. J. CANFIELD
American Rolling Mill Co., Middletown, Ohio

ENAMELERS usually exercise their art under carefully controlled conditions. Nevertheless, occasional defects will appear. A most discouraging fault is copperheading, the reddish brown spots which often ruin sheet iron ground coat enamels. The author herein discusses the factors causing this iron oxide defect, and reviews the various practices which result in a minimization or complete elimination of copperheading.

ing of the enamel and particularly the crack or crevice stage may be noted. Oxidation of the metal proceeds through the infiltration of air to the metal through these openings. This oxidation proceeds until the enamel has fused or covered the surface.

Methods have been devised whereby the enamel glass and the metal itself may be polished cross sectionally and intact so that their structures may be microscopically examined. A cross-section of one sample of enamel and metal in a much underfired state is shown in Fig. 1. The light area is the metal and the dark area is the enamel. It is to be noted that much undissolved iron oxide exists between the enamel and the metal. Another much underfired sample is shown in Fig. 2, with many small bubbles and some undissolved oxide at the interface.

As the enamel fuses, there is first formed a solid mass with practically no bubbles. Then small bubbles begin to form and are liberated by escaping from the enamel, and as fusion continues the iron oxide layer is absorbed by the enamel. In Fig. 3 is shown a section of a sample where the iron oxide has been dissolved, forming a layer which appears different from the other enamel when examined by the microscope. This has been called a "hazy" layer, and is a solution of iron oxide in the enamel. It has different light-reflecting properties than the other portion of the enamel.

As the firing proceeds, the bubbles in the enamel layer become fewer and larger until, at the normal firing period, they are on the average about one-third the thickness of the enamel coat or approximately one-thousandth of an inch in diameter. Peculiarly, most all of the bubble distribution is toward the outer surface of the enamel or above what has been called the hazy layer.

Longer firing produces large bubbles, some of which are practically as large in diameter as the thickness of the enamel coat itself. These, of course, are sources of weakness and may be indicative that the enamel was fired rather hard.

High Oxide Causes Crystals

It is interesting that layers of iron oxide may be covered by enamel, but good adherence is developed only when the free iron oxide has been practically all absorbed by the enamel. If the enamel is able to readily dissolve all of the oxide, good adherence may be obtained while, with an excessive amount of oxide, poor adherence may be expected. Excessive amounts of oxide may cause crystals to form in the enamel.

The desirable enamel structure is one with little or no undissolved oxide at the interface and with the so-called hazy layer penetrating about one-third the way from the metal to the surface of the ground coat enamel.

It is generally considered essential that some iron oxide be formed during the firing in order that good adherence be obtained. It is considered that iron oxide dissolves in the enamel and, with the aid of the adherence oxides, attacks the metal to give mechanical and chemical attachment.

Before the structures of copperheads are discussed, one series of experiments might be advantageously described. A commercial enamel was fused with iron oxide in crucibles with no iron present. Mixtures of varying amounts were made. These melts were milled to pass through a 200-mesh screen and cones made of each. The softening points were determined

FIG. 3.—A normal fired ground coat enamel as seen sectionally at 500 diameters. The so-called "hazy" layer of iron oxide in solution with the enamel extends from the juncture. The enamel is shown here as the dark area, whereas the base metal is the light area.

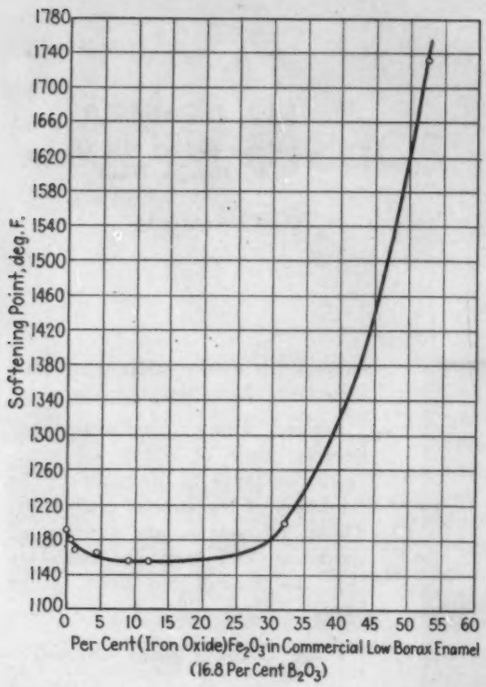


FIG. 4.—Effect of iron oxide on enamel. Note that the enamel has a critical softening point which is determined by the quantity of iron oxide present.

in a furnace heated at 1 deg. F. per min. and the softening point determined as the point at which the cone tip reached the base. These relative softening points with different enamels gave curves such as shown in Fig. 4. The softening point is plotted against per cent weight of iron oxide in the enamel.

It is to be noted that small percentages of iron oxide lower the softening point of the enamel and that further amounts of iron oxide have little effect until the softening point is sharply increased. Iron oxide of about 50 per cent will raise the softening point far above the range of ordinary enameling temperatures.

With the compositions where the softening point is raised by the presence of iron oxide, it was noted by microscopic examination that crystals of iron oxide begin to appear, and the higher the softening point the greater is the increase in quantity of oxide crystals.

A few photomicrographs will illustrate this more clearly. Fig. 5 shows a section through one of the cones which contained enamel with 16.8 per cent B_2O_3 and 15 per cent Fe_2O_3. No crystals of iron oxide appear at this concentration, as the enamel is able to hold in solution this quantity of oxide. The same enamel composition (Fig. 5) with 22 per cent Fe_2O_3 shows some iron oxide crystals separated because of saturation. The same enamel composition with 50 per cent iron oxide has many separated crystals.

For comparison, Fig. 6 shows an enamel composition with 22.5 per cent B_2O_3 and 25 per cent Fe_2O_3 in which a few crystals of iron oxide have separated. This same enamel composition with 30 per cent iron oxide is also shown. It is readily noted that this enamel is able to dissolve more iron oxide and the fusion range is correspondingly increased on account of the increased boric oxide content.

Oxidation Occurs in Three Degrees

The mechanism by which the iron oxide crystals form is somewhat as follows: The iron oxide is more soluble at higher temperatures than at lower temperatures and when more oxide has dissolved while at the higher temperature than could be dissolved at the lower temperature, then crystallization or separation of iron oxide crystals will occur on cooling to the lower temperature. Thus, the concentration or amount of iron oxide dissolved and its different solubil-

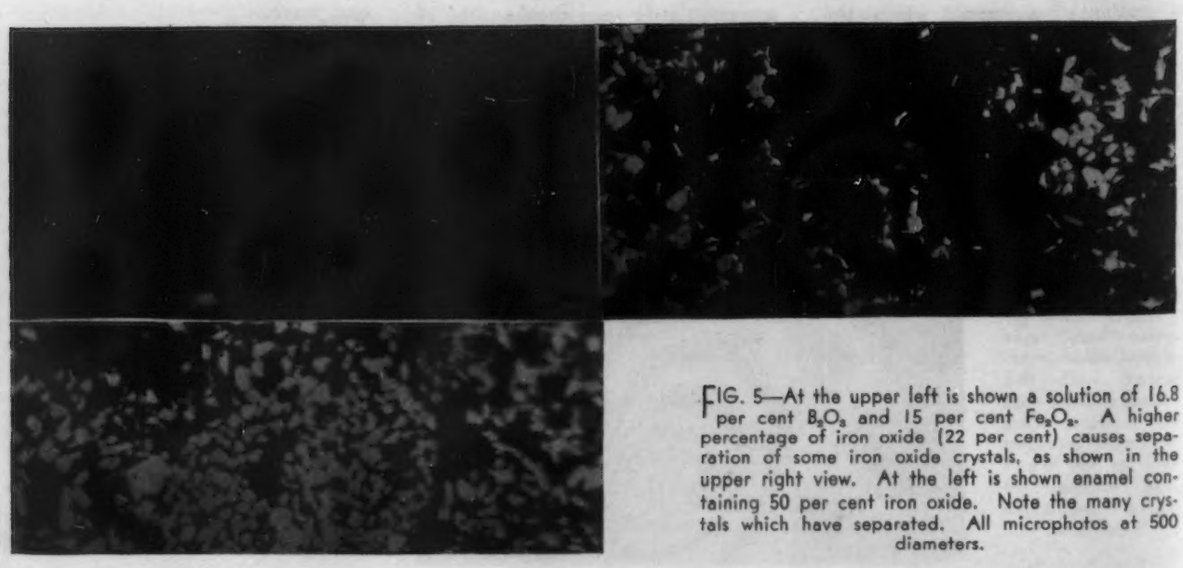


FIG. 5—At the upper left is shown a solution of 16.8 per cent B_2O_3 and 15 per cent Fe_2O_3. A higher percentage of iron oxide (22 per cent) causes separation of some iron oxide crystals, as shown in the upper right view. At the left is shown enamel containing 50 per cent iron oxide. Note the many crystals which have separated. All microphotos at 500 diameters.

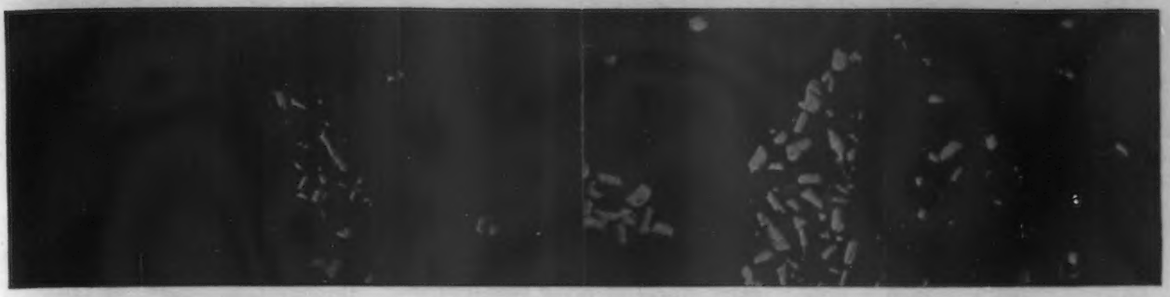


FIG. 6.—Enamel composition having higher boric oxide content. At the left the iron oxide content is 25 per cent and at the right the content is 30 per cent. The increased boric oxide content enables the enamel to dissolve more iron oxide.

ity at the different temperatures control whether crystallization will occur.

From the fact that iron oxide crystals have been identified in copperhead structures and that iron oxide crystals cause the fusion point to be raised, it reasonably follows that the presence of the relatively infusible oxide crystals is the explanation for the relatively infusible mass that exists in most copperheads.

For convenience of discussion, oxidation may be considered as occurring in three degrees, namely, normal oxidation, oxidation insufficient to saturate the enamel even on cooling, and excessive oxidation.

The first degree of oxidation may be considered to be the normal layer of oxide which forms in the early stages of the enamel ground coat firing. The action of this in the normal firing process has already been discussed.

The second degree of oxidation may be considered as the formation of mounds of iron oxide at local spots or a thicker layer and not sufficient in quantity to saturate the enamel even at the lower temperatures. If this oxide exists in mounds, it may dissolve and free the bubbles, leaving a darkened spot and what might be called "pock marks." It was previously noted that small amounts of iron oxide lower the softening point and these dark spots in the enamel are where local oxide spots have dissolved and fluxed the enamel to give dark, depressed, bubble-free spots. The iron oxide at this spot has usually all dissolved and remains in solution and no crystals separate on cooling. It is to be noted that there are also other causes of similar appearing depressions in enamel and that the appearance of such a spot is not absolute proof that iron oxide was the cause.

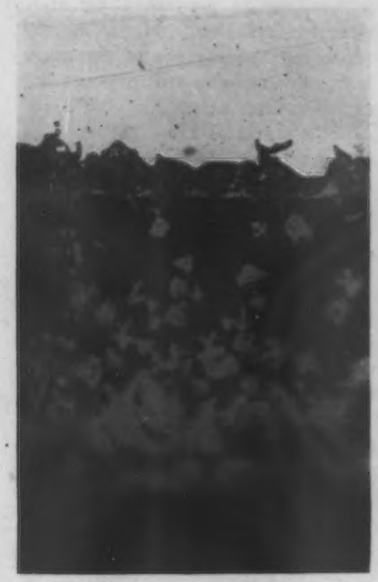


FIG. 7.—Iron oxide crystals in a depressed copperhead. The dark area is enamel. Photo taken at 500 diameters.

The third degree of oxidation may be considered as that amount of oxide which will overload the enamel. This amount may be highly localized and give copperhead structures or iron oxide defects. There may be present only sufficient oxide to saturate the enamel and form a few crystals as it cools, but often there is sufficient oxide to saturate the enamel at the enameling temperature and leave some undissolved at the interface. The oxidation may have been sufficient to leave exposed scale around which the enamel has attempted to flow.

The essential difference of "raised" and "depressed" copperheads is the amount of excess oxide present. Those depressed have larger local spots of excess oxide.

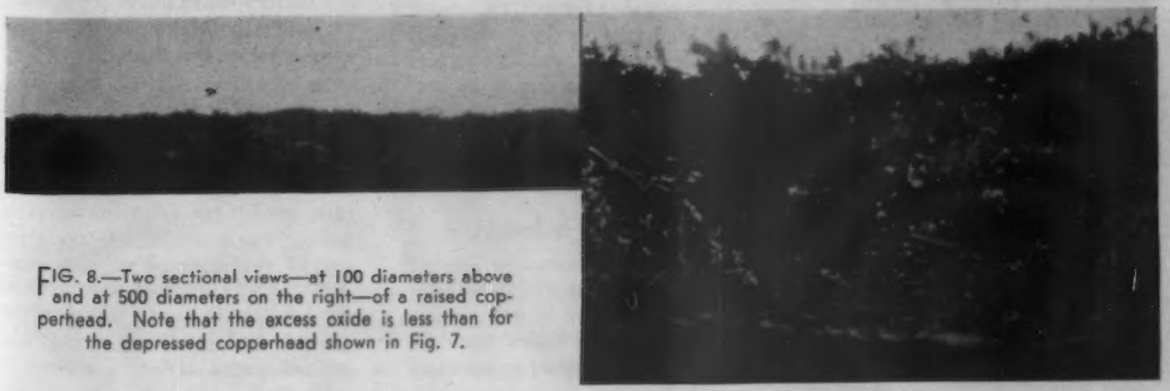


FIG. 8.—Two sectional views—at 100 diameters above and at 500 diameters on the right—of a raised copperhead. Note that the excess oxide is less than for the depressed copperhead shown in Fig. 7.

A section through a depressed copperhead is shown in Fig. 7. Fig. 8 shows two views of a section through a raised copperhead. It is apparent that the amount of oxidation is the chief difference. It should also be noted here that a general bronzing of surface of the ground coat is a result of a general excessive oxidation rather than excessive in local spots.

When ware is de-enameled, it is found that copperheads leave the metal in an etched or slightly pitted condition. This irregularity occurs even though the copperheads may have been produced by several different causes. The amount of pitting is apparently dependent on the amount of oxidation and reaction of dissolved oxide with the metal. The etched pit may be a comparatively small pit or a ring with essentially no roughening in the center. Such pits may be produced by various degrees of disturbance by use of a pin on the dried ground coat before firing. Excessive oxidation decreases the fluidity of the enamel, which explains the etched pit structures. The metal is attacked only where the enamel can dissolve the oxide and remain relatively fluid, thus the attack is around the edges of spots of excessive oxidation. The pitted effect is not the cause of the defect, but the result and evidence of excessive oxidation.

Many Causes for Copperheading

It would be futile to attempt an explanation of all specific cases of copperheading or iron oxide defects. It is, however, beneficial to discuss some observations of specific cases in order that preventive measures may be readily devised after consideration of the mechanism of formation.

The diagnosis of the specific cause is often obtained only after a few directed experiments since the actual evidence is usually destroyed during the ground coat firing.

There may be enumerated many different specific causes of copperhead defects. Some of these are insufficient cleaning, thin enamel coat, metal surface, improper drying, heating rates, furnace atmospheres, enamel characteristics and plant processing conditions. These are inter-related through obtaining the condition whereby excessive local oxidation may occur.

When copperheading occurs, usually the first changes in an effort to control it are made with the cleaning process. The effect of cleaning the metal is to insure that the enamel will wet the surface as well as to slightly roughen it. A smooth surface does not wet so readily by enamel as does a rough surface. The function of the cleaning process is to remove dirt, grease or materials which in the early stages of firing will tend to open the enamel coat and promote excessive oxidation.

A considerable number of observations have shown that most copperheading is prevented by good cleaning practice. Often, merely scrubbing the surface of the ware in the enamel slip will prevent the excessive oxidation by either removing material from the surface and giving thorough wetting or by increasing the weight of enamel carried.

Instances of copperheading also have been noted in which one metal surface was less readily cleaned than another or the surface carried less enamel than another and the excessive oxidation occurred on the less readily cleaned metal.

Instances of copperheading have been noted in which one metal stock showed excessive local oxidation more readily than other stock being run at the same time. In the greater majority of instances the cause was insufficient cleaning of the metal surface with the sometimes added condition that the metal carried a thinner coat of enamel. It is, therefore, desirable that the cleaning process be such that the surface is slightly attacked and left clean.

There have been many instances in which attempts to use a thinner ground coat have resulted in many spots of excess oxide formation. Merely increasing the weight of ground coat has eliminated the trouble.

The metal surface, as stated above, is a factor in the weight of enamel carried and this affects the oxidation. Carbon on the surface will tend to promote excessive oxidation by keeping the enamel open. This may be noted in some cases of primary boiling.

Heating Rate Is Important

Rusting from improper drying will tend to give spots of excessive local oxidation. It is quite interesting that in the hollow ware industry a mottled effect is produced on some of the ware by production of some localized rusting. These rust spots are controlled as found by experience in the use of various additions to the enamel slip. This mottled effect from rusting is obtained by the fact that the oxide, in small quantities, acts as a flux and the enamel fires down differently in the various areas.

The rates of heating the metal through range below the fusion of the enamel affect the quantity of oxide formed. It is well known that oxide defects are more readily produced in some furnaces than others and this appears to be related to heating rates as well as atmosphere. Firing tools and furnace load are also factors in heating rate and influence the oxidation. Different furnaces have sometimes given different results on the same stock and this probably was associated with heating rate.

Several experiments are recorded that moisture in the furnace atmosphere affects the oxidation of the metal. Wet ware entering the furnace and non-ventilation of the furnace have in some cases been associated with oxide defects. Comparatively little data have been obtained on the composition of gases evolved from the enamel which might accumulate in the furnace and influence oxidation.

There are some properties of enamels which are a factor in the amount of oxidation which may occur. Those which have a greater capacity and which flow at lower temperatures will tend to decrease copperheads.

Some processing conditions, such as continued scrubbing of ware in the ground coat slip, tend to accumulate bits of scale and iron which can cause excessive spots of oxide. Such conditions as fineness of grinding, spraying instead of dipping, and heavy coats of enamel are factors which affect the amount of oxide to be formed at the enamel-metal interface.

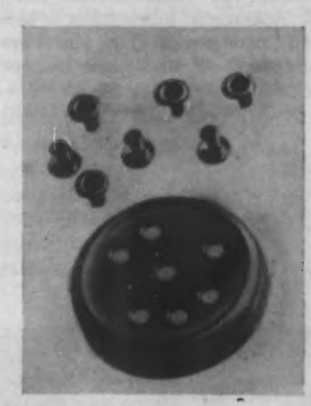
In conclusion, it is interesting to note that oxidation of the metal surface, which is generally considered necessary for the development of adherence, may occur under certain conditions to give defective ware. The oxide defects are a result of oxidation such as to overload the ground coat and preventive measures are those which control oxidation within low and desired limits.

Resistance Welding Important In Development of All-Metal Radio Tubes

WITHOUT resistance welding it is doubtful if the all-metal radio tube, which has stirred up a hornet's nest of interest throughout the radio industry, would be practical from either a mechanical or production standpoint, according to engineers of the Thomson-Gibb Electric Welding Co., Lynn, Mass. It takes the precise control of welding variables provided by a modern welding press to handle the special alloy eyelet seals, the vacuum-tight projection weld of the shell to the header, and the "welding off" of the exhaust tube, it is explained.

Some of the steps in assembling a tube are shown in the accompanying illustrations. The special alloy eyelets are welded to the nickel-plated header cup by a Thomson-Gibb No. 2 press; and after the terminal wires are inserted and brazed to the eyelets, the exhaust tube is welded to the center of the cap by a No. 1 press.

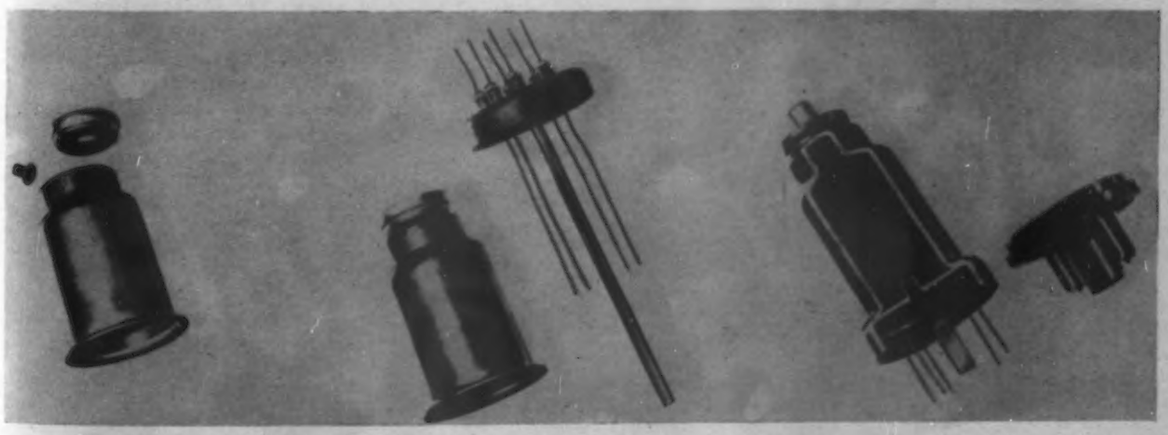
The first operation of the shell unit joins an eyelet to the inside of the top, followed by a cup for the top terminal which is joined to the outside, both welds being made on a Thomson-Gibb No. 1 machine. The next resistance weld joins the completed shell to the header. It is made on a No. 2 welding press. After the shell is exhausted, the exhaust tube is pinched and welded off by means of a Thomson-Gibb gun welder. The addition of a top terminal and a molded base completes the tube.



EYELETS made of a special alloy are resistance welded to a nickel-plated header. Other steps in the production of the new all-metal radio tube are shown in views below.

All-metal radio tubes are smaller than the conventional glass tube—at least 50 per cent smaller in most cases—and are stronger. The metal parts can be shaped to exact limits, and assembled with closer tolerances. The metal tubes are also said to permit greater flexibility of design.

An objection voiced against the all-metal tubes has concerned the amount of welded area. Counting all the lead-in eyelets and the weld between the shell and the header, there are about 4½ in. of vacuum-tight welds on a typical seven-prong tube. Critics have pointed out that compared with a glass tube of the same type which has less than ½ in. of contact at the lead-in wires, the metal tube multiplies many times the chance of leakage. Thomson-Gibb engineers state, however, that with the tubes now actually in production experience shows that with proper welding equipment the danger of faulty welds is quite remote.



ELEMENTS of shell assembly are at the left, and the complete shell and header assemblies are at the center. The cut-away view shows detail of header-to-shell eyelet weld and exhaust tube pinch-off.

Improvements in Production

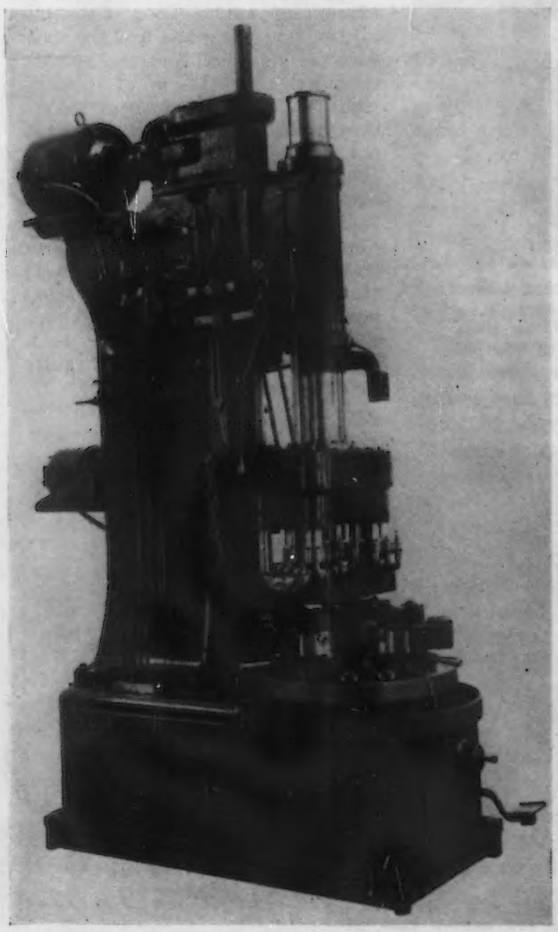
"Hydram" Drills Employ Hydraulic Work Heads and Indexing

HYDRAULIC ram drilling machines are now being offered in three major sizes, 1¼, 2 and 3½ in., by the Barnes Drill Co., Rockford, Ill. The hydraulic pressure is applied directly over the center of the multiple head or the cutting tool, thereby eliminating a long saddle on the columnways for maintaining alinement. The driving power is direct to the cutting tool with a minimum of torsional vibration. Constant support is provided on both the upper and lower bearings throughout the entire spindle travel. The design is suitable for vertical, horizontal and angular applications in boring, reaming and facing operations. Multiple operations are performed through the use of multiple "Hydram" heads on a hydraulic indexing table.

The hydraulic cylinder, large ram, and short spindle comprise an individual unit. Through adjustable stops hydraulic control permits automatic rapid approach, feeding rate, dwell for facing, and quick automatic return. All gears are made of heat-treated alloy steel. Automatic lubrication is employed throughout. The slow hydraulic feed of about ½ in. per min. may be increased up to 16 in. per min. as the fastest normal feed. Rapid approach is about 6 in. per sec., independent of the speed of the spindle or auxiliary head.

The cylinder and ram are superimposed directly over the working tool or auxiliary head, and are attached to the column. This assembly provides adaptability for horizontal and angular applications. The ram may be provided with a flange for mounting of auxiliary heads. In the lower end of the ram two Timken bearings support a short, stocky Morse-taper socket spindle. A 6-splined vertical drive shaft, from the gear box at the top of the machine, is mounted in Timken bearings, and drives to a gear case attached to the nose of the ram. The ram is of double the normal length of the cylinder, giving constant support in the bearings at both the top and bottom of the cylinder, thus providing resistance against lateral strains and eliminating a long saddle on the columnways.

Partial specifications for the 3½-in. Hydram are: Swing, 32 in.; face of column to center of table, 16¼ in.; spindle to regular table, 33 in.; spindle to base, 49½ in.; vertical travel of spindle, 20 in.; vertical travel of table, 22 in.



HYDRAM drilling machine equipped with hydraulic indexing table. The upper motor drives the spindle rotations and the lower motor drives the hydraulic pump for indexing the table.

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THIS hard-faced punch, used for hot punching jaw slots in wrenches, is said to have an average life per grind of 7800 pieces. The slug shown is 0.80 per cent carbon steel and punched from ¾-in. stock. The range is from ¼ to 1 in. in thickness. The punch is faced with cobalt-chromium-tungsten alloy, a material unique in its hardness and abrasion-resistance at elevated temperatures. Photograph courtesy of Haynes Stellite Co.

and Shop Equipment . . .

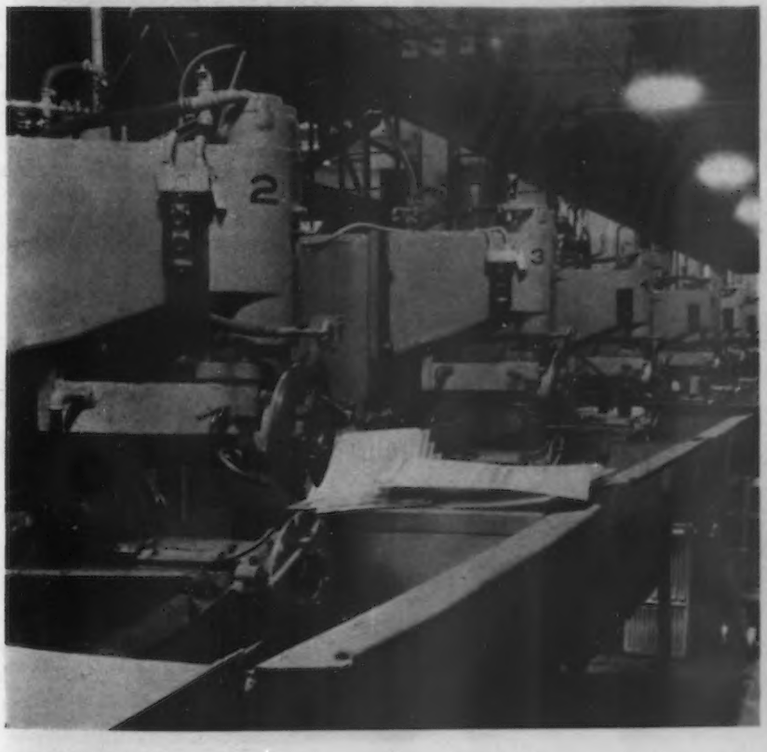
Battery of 16 Seam Welders Makes 4800 Welds a Minute

THE line of seam welding machines here illustrated is part of a battery of 16 now operating at the Schenectady works of the General Electric Co. in producing evaporators for refrigerators. As each machine makes 300 spots a minute, the production capacity of the line as a whole is 4800 welds a minute.

Why seam welders are used to make spot welds is explained as follows by the Thomson-Gibb Electric Welding Co., whose 1000 series machines make up the battery: The evaporators are made up of two sheets of metal with hollows or flutes pressed into the surface to form evaporating chambers. While the outer edges of the two halves are joined by a pressure-tight seam weld the job requires only closely spaced spot welds between the chambers. In this case the welds could be made better and faster by intermittent seam welding on the same seam welder than by spot welding on a regular spot welding press. Intermittent seam welds are made by applying the current in short cycles in relation to the speed of the welding rolls.

Another unusual feature of these seam welders is the design of the welding roll. The welds must start close against an obstruction on each end of the shell. By cutting out a small segment of both the upper and lower rolls, a way was provided to fit the parts between the rolls and start the weld flush with against the obstruction. Because the design of the evaporator calls for seams of varying length, it is not possible to make these welds in one continuous operation. It takes only a little longer, however, for the operator to start the weld at one end, run it half-way down the piece and then turn the work end for end and start another weld which meets in the center. To make this as efficient as possible, the welding rolls are fitted with an arrangement of counterweights that bring the segments back into starting position as soon as the foot valve which operates the machine is released.

Before the above-described method was adopted, the parts were assembled by spot welders, which operated at the rate of 150 spots a minute, or at about half the speed of the seam welders illustrated.



Electric Device Provides Related Controls

A "RE-SET" control instrument, said to possess complete adaptability to control requirements encountered on temperature, pressure, rate of flow, and liquid level applications, is announced by Taylor Instrument Companies, Rochester, N. Y. The instrument can be used on all applications where a fixed differential must be maintained between two variables, one of which is under control; or where it is desirable to change the control point of a process in accordance with a predetermined ratio to a secondary process or condition.

Two types of ratio adjustments are possible, direct and inverse; either of these adjustments, as well as changes from one to the other, are easily accomplished without auxiliary parts.

For temperature applications, the instrument may be mercury, vapor or gas actuated. The chart is rotated by either electrically driven or spring driven clock movement. The die cast aluminum case is supplied for either face or flush mounting on panel boards. Finish can be either black or white.

Motors for Refrigeration And Air-Conditioning

NEW squirrel cage motors of normal and high torque have been designed with particular reference to the requirements of refrigeration and air - conditioning equipments. The Century Electric

Co., St. Louis, maker, announces cast frame and end brackets, ample sized shafts and bearings, and well-anchored field and rotor cores, as important operating factors in these fields of motor application. Electrical ruggedness is provided through the use of electrolytic copper bars and end rings so joined as to form a homogeneous, high conducting joint. The motors are available in either sleeve or ball bearing design in sizes 600 hp. and smaller. The equipment is pictured above.

Micrometer Caliper in Base Mounted Type

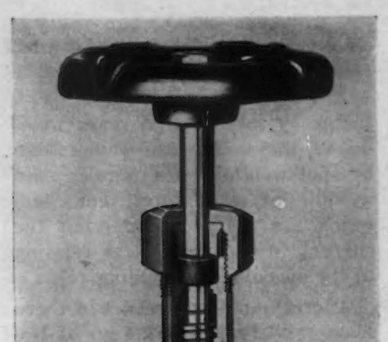
BROWN & SHARPE MFG. CO., of Providence, R. I., has recently announced the addition to its line of a new bench micrometer caliper, No. 240RS, particularly for inspectors, watchmakers, manufacturing jewelers, and for fine measurements.

The reading is to ten-thousandths of an inch direc by an auxiliary thimble and has a range of measurements of 0 to 1 in. The parts of ten-thousandths can be estimated readily. Gears or intricate mechanisms are not employed.

The base is rigid and heavy to prevent tool from being upset easily. Tool is furnished with ratchet stop.

New Plug Type Valve Distributes Flow Force

THE valve illustrated below has been designed by the Fairbanks Co., 393 Lafayette Street, New



York, for service where there is excessive wire drawing or destructive action of any kind on valve seat or disk, such as when used for drip, drain, throttling, etc. A long seating surface is provided between the plug and the seat, and if the surfaces become scored or cut they can readily be reground or renewed. The angle of the plug and seat-ring sealing surfaces provides that the flow is uniformly distributed when passing between these components. The makers state that the force of the stream cannot be concentrated on any part of the plug or seat and produce erosion or wire drawing. The seat ring is screwed into the diaphragm, providing easy removal. Both seat and disk are made of special nickel alloy. Regrinding does not require removal of the valve from the line. A spindle shoulder affords a back seat which permits packing the stuffing box under pressure with the valve wide open.

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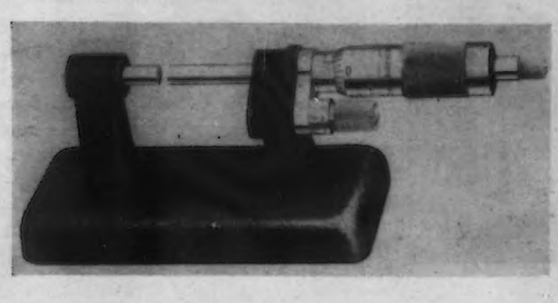
BELOW

THE bench micrometer caliper illustrated below is an addition to the Brown & Sharpe line of the fine measuring devices.



Small Plating Unit For Occasional Lots

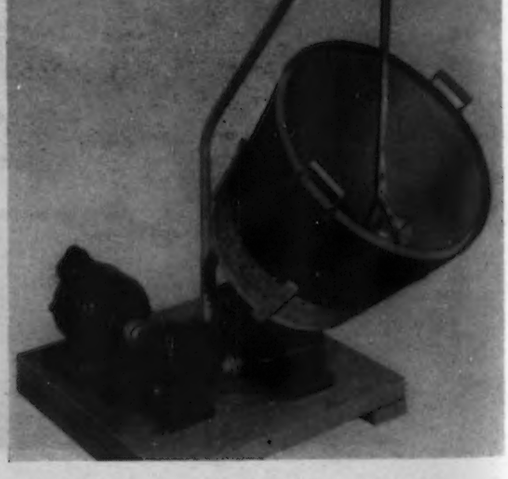
UDYLITE CO., Detroit, has developed for the plating industry a small barrel plating unit, "Handiplater," capable of either occasional small quantities of work or the production plating of small quantities or of small parts. The equipment is illustrated below. It is said to be an original development in its type.

Any solution common to barrel plating operations can be used.

The cylinder is detachable and thus provides availability for several plating operations, combined with ease of manipulation and operation.

AT RIGHT

A DETACHABLE and easily removable cylinder features the convenience of small-lot plating equipment shown at the right.



Steel-Forged Casters

NEWLY developed steel-forged casters, manufactured by the Standard Truck Caster Co., Manistee, Mich., are shown in cut-out view below. Lightweight and unbreakable materials are fea-

tured. The king pin and lower ball race member is a unit forging. Anti-friction bearings are used, as are hardened axles. Wheels may be steel forged or Metzgar endwood. Diameters are 4, 5 and 6 in. Distribution is through the Metzgar Co., Grand Rapids, Mich.

Improved Chaplet Has Cut Shank Serrations

A NEW chaplet has been placed on the market by the Angell Nail & Chaplet Co., Cleveland. The device is illustrated below.

The shank is cut with deep spiral serrations from either end toward the center where they are divided by a narrow strip of metal of slightly wider diameter than the shank. These serrations make it impossible for chaplet to turn in the casting, and the center makes a seal against all pressure of gases or liquids. As the special metal, of

which the chaplet is made, blends and fuses with the casting, the chaplet does not turn, blow out, or leak.

The heads are electrically welded to the shank by a special process. In actual tests, the heads have been twisted by heavy power and have resisted effort to part them from the shank.

The production range covers all sizes with both round and square heads.

Standard Colors as Valve Purpose Index

FOR indicating valve service, Jenkins Bros., New York, have adopted five standard colors for a new valve wheel, molded of colored plastic materials. The assembly can be employed with unmarked

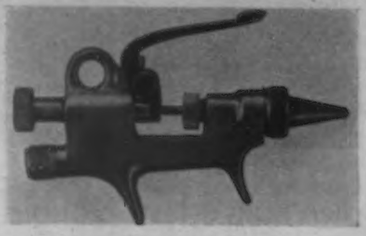
wheels or with service markings in relief on the top face of the wheel. Special colors or markings can be supplied for use with valve-control installations in which color details have been established. The wheel is described as strong, cool to the touch, easy to grasp and permanent in color.

Flow Gun for Plastics

DEVILBISS CO., Toledo, Ohio, has developed a new type flow gun, designed particularly for individual jobs on work such as striping automobile bumpers, and for flowing sealing compounds, cements, and other plastic materials. The gun is pictured above at right.

In operation the material is forced from the nozzle directly onto the work. Either single or multiple nozzles which will flow any width of stripe up to one inch may be used. Multiple nozzles may be designed to flow parallel stripes of either equal or unequal widths.

Material flow with single nozzle guns may be controlled either by

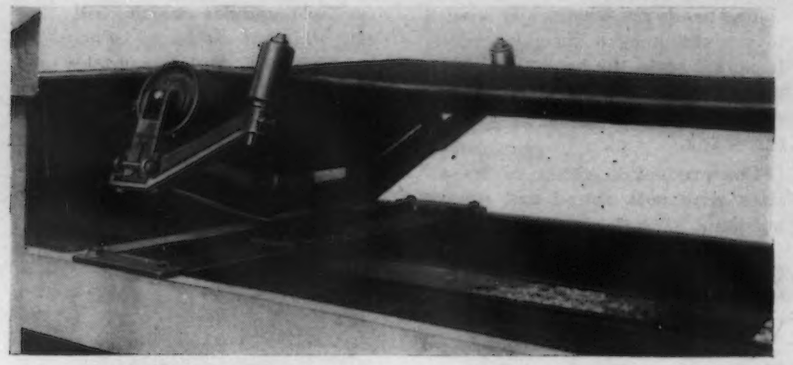


regulation of fluid pressure or by adjustment of fluid needle travel. Multiple nozzle guns are provided with a small needle valve at each nozzle. Operation may be either by thumb or index finger.

Valve Flow Control by Micrometer Adjustment

A NEW valve, providing flow control through micrometer adjustments of one-tenth turn, is announced by Hancock Valve Division, Consolidated Ashcroft Han-

cock Co., Bridgeport, Conn. The valve is illustrated above. Utility is for steam, gas or liquids. Steam flow is regulated in lb. per hr. The device is designated as the "Flo-control" valve and has bronze body for pressures up to 300 lb. Globe or angle types range from ⅜ in. to 2 in.

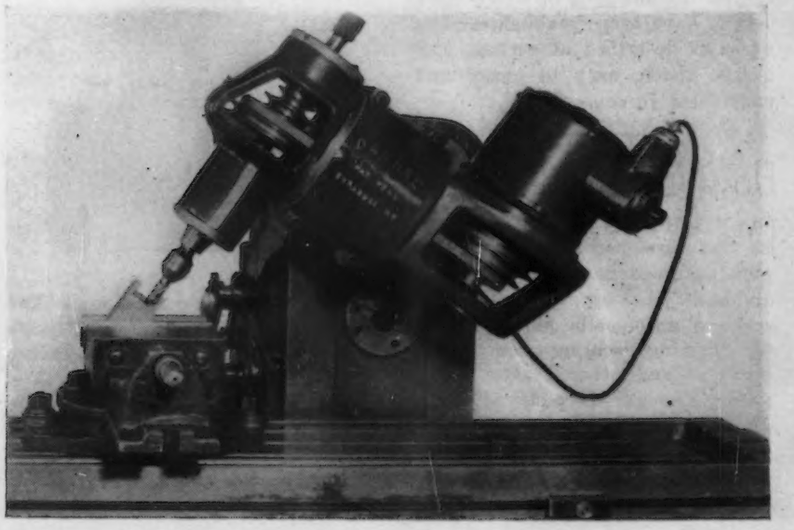


Idler Rolls Have Double Belt-Alining Utility

A SELF-ALINING anti-friction idler for troughed conveyor belts is announced by Link-Belt Co., Indianapolis. The illustration is above. The idler is made up of standard belt-carrying rolls mounted in a supporting frame which is provided with arms extending parallel with and at the sides of the belt, on which "actuating rolls" are mounted for the purpose of swiveling the idler frame promptly when a crooked running belt crowds sidewise sufficiently to engage either roll. This troughing idler frame is supported by an anti-friction pivotal bearing, carried on a cross-member or subframe bolted to the conveyor stringers. If the belt gradually crowds sidewise it automatically causes the idler to swivel on its pivotal mounting, and the carrying-idler rolls steer the belt back to a central position without the belt edge contacting an "actuating roll." Should, however, the belt suddenly or continuously persist in crowding sidewise and engage an "actuating roll," the self-alining idler would be positively swiveled the amount necessary to realine the belt with the adjacent stationary idlers.

"Speedmill" Attachment Range 350-4000 R.P.M.

A HIGH-SPEED milling attachment for use with milling machines and boring mills is illustrated, mounted, below. It is a product of Dalrae Tools Co., Syracuse, N. Y., and is designated as the speedmill attachment. The equipment is built in one size only, but can be equipped with either ¼ or ½-hp. motor, giving a range of speeds from 350 to 4000 r.p.m., and capacity to mill with cutters from 1/16 to ⅞ in. in steel. The spindle is of 3½ per cent nickel steel, hardened and ground. Aluminum alloy castings are used throughout. The spindle housing and the main swivel and motor mounting are a unit casting. The spindle pulley, weighing 5 lb., and mounted between three sets of ball bearings, produces a flywheel action. The draw-in rod is arranged to push collets out as well as to draw them in and clamp them. Split collets having full bearing in the spindle taper hole are recommended. Four wide surface pads and a yoke which is not split provide for mounting. A reversing switch provides for right and left cutting. Squaring surface and graduated scale meet the requirements of angle setting. The standard attachment is for a 4½-in. milling machine overarm; adapters for smaller diameters, rectangular overarms and for horizontal boring mills are available.



Combined Cooling and Heating System

MODINE MFG. CO., Racine, Wis., announces its line of unit industrial coolers available in two types and seven sizes. The

new line provides combination use in cold-water cooling and steam for hot-water heating applications. The moisture eliminator, used in cooling, can be conveniently removed. Cooling medium employed may be well or tap water, non-corrosive brines, ice-chilled water or mechanical means. Direct expansion type coolers have the same scope of application but have a specially constructed core and are used in conjunction with a compressor, employing direct expansion gases such as methyl, chloride, freon or ammonia.

Thirty Per Cent Saved In Truck Body Weight

A REDUCTION in truck body weight from 5000 lb. to 3375 lb. and a corresponding increase in pay load are attributed by the Heil Co., Milwaukee, to the use of 12-gage high-tensile steel and shielded arc process welded construction as compared with 8-gage mild steel riveted construction. The truck body, as shown, is 12 ft. 6 in. long, 7 ft. wide, 5 ft. 3 in. deep and has capacity-rating of 12 tons. The subframe and shell are welded as separate units, then welded together. The subframe consists of 24-in. cross members welded integral with 5-in. longitudinal members.

The body shell, built of 12-gage steel plates, has its own frame work consisting of section, channels and angles, both vertical and longitudinal; these are welded to the outside shell for rigidity.

Unit Blueprinting and Accessory Equipment

FLOOR models of the Angstrom lamp blueprinters are announced by Milligan & Wright Co., 4625 Prospect Avenue, Cleveland. The equipment, illustrated below, embodies an arrangement for washing and fixing trays and for drying boards in the base. These are shown extended for use. The floor space required when closed is 28 by 30 in.

Provision is made for convenient completion of blueprints through use of the portable unit shown at the left.

The use of an incandescent lamp for blueprinting has long been recognized as the means of utilizing simple inexpensive equipment, capable of being plugged into any 110 volt A.C. or D.C. light socket, but, heretofore, the long exposure required made it impracticable.

This incandescent lamp equipment is said to produce prints with exposures of ¾ to 1½ minutes, depending upon the drawing and paper used. A time switch cuts off the current at the end of the exposture period.

The machine has a capacity of one 18 by 24 in. or several smaller prints at one time.

Special Shell Design For Grab Bucket

ROBINS CONVEYING BELT CO., 15 Park Row, New York, announce a new, type RH, Mead Morrison Division, rehandling grab bucket. Special shells are employed. In shape they are between flat and round, giving the advantages of the flat shell for digging and filling and of the round shell for quick discharge. Low height, extra width and a low center of gravity result in less need for headroom, for example in vessel or car, and provide for stability on a pile. The rope reeving is without bends and gives three-part purchase for rapid opening and closing. The top head is of structural steel with a manganese steel fair-leader bolted in. The hinges are of cast steel and double-ear construction with large bearings. All bearings have high-pressure lubrication. The links are of large-diameter steel tubing welded to the cast-steel ends; rounded surfaces are provided for the avoidance of damage to barges, cars, etc. The equipment is illustrated below.

Special shape designs are available for height, and low center of gravity conditions in connection with the utilization of grab buckets. An illustration of such design is shown at the right.

LETTER TO THE EDITOR

A Reader Takes Exception

To the Editor:

Your editorial page 13 of June 13, 1935, THE IRON AGE.

This depression, as all that have gone before, "was caused and prolonged by a lack of consumer buying power."

The "margin above costs remains unspent" is certainly most true.

Your premise is based on the common gossip that these are the going beliefs, and therefore you readily state they are "fallacious assumption."

You do expound the true theory when you say "when . . . confidence rises, business will again become a large buyer."

If taken literally, we should have to say, you said all this in a moment of haste to ballyhoo your new capital goods index, which will be a nice thing to follow, but it will not prove anything except to show the tidal movement of business.

Firstly, let us consider conditions in 1929. Confidence existed and consumer buying power—plus credit—as well as business margins above cost—also plus credit—was being turned over daily. There was movement of money and trade. The question of sufficient percentages to workers is not really a part of the subject. Were they given a larger ratio, it would simply mean they would go on for a longer period and the rate of slowing down would be a little slower.

Well what happened? Was it because consumers were not properly equipped with buying power (and we all know that the workers' average wage of $1,100 to $1,600 yearly proves they were not) or was it because business ceased buying? No, indeed. The amount of money or its percentage division in either group was immaterial.

Here is what happened. All the suppliers of money and credit began to fear about collections, stiffen up on credit, on demands for payment and the turnover started slowing up. The act of slowing up was quickly sensed by the masses, they retracted, held back and a "Black Friday smash" was soon upon us.

Industry stopped, stocks fell, business stagnated and the suppliers of money (capitalists—all people with savings accounts, insurance, etc., are the capitalists, not only the few rich men usually singled out) found their own equities disappearing. The destruction of confidence in a moving, going business "shot the works." It was caused and prolonged because the consumer did not have sufficient reserve to step in and reverse the tide. It has been so in all other depressions. Nor did business, to any extent, help very much, inasmuch as "when profits appear" was not a nearby picture.

The non-circulation of money freezes turnover, except for bare necessities. Money was riding a very small top circle, who in the early stages of this last slump made trade indefinitely worse by retraction in even their normal spending. This large-scale retraction brings losses and shrinkage of values to the rich man, in larger proportion than to the worker. The losses and shrinkage of the rich are capital losses; those of the workers are only in potential earnings. Many of these capital losses are never recovered, but dissipated in the next effort to restore confidence and start the wheels moving again.

Therefore, with continued consumer and business buying we should have voided a depression and therefore they are to blame for our situation.

Our system has been such that a percentage division irrevocable as time itself, whereby the larger holders of wealth receive the larger volume of income; these holdings are compounded yearly. Gradually the concentration narrows into a smaller and smaller group, that hold the wealth and future earnings of the masses in mortgage — credit purchases, national, State, county and city bonds, real estate mortgages, etc., until they (and here is the dynamite) fear about collections.

Now—how do we get out of this? The same as we always have. Things get to a depletion basis. The pressure of need starts us to a repetition of excessive production, investment, credit inflation, etc., until money contraction again arouses fear for collections and bumps the wheels of trade.

We are now in that period of slowly climbing uphill and your capital goods charts will map this period for us, but it is to be remembered that all capital goods have consumer origin. Forward corporate buying is in expectancy of later consumer demand. Only increased consumer demand to move more goods produces the need for new or replacement railroad cars and locomotives. This developed need in turn produces the need for new or replacement machinery and buildings to build these cars and locomotives. The demand for more electrical devices, fans, irons, iceboxes, toasters, etc., produces the need for new or replacement machinery and buildings in which to produce them, as well as additional power houses. Upon all of these things depend the consumption of steel; even bridges are a consumer device. No Washington bridge across the Hudson or the Brooklyn bridge across the East River would be extant unless there were consumers to make use of them. Increased consumer demand (subscribers) to your IRON AGE would require more printing press time and involve more quickly the wearing out of presses and their earlier replacement, along with the necessary machine tools to produce the new presses.

Consumer buying power is king; has been since the early days of settlement in this country, when barter made trade; when the lack of moving goods to barter caused slumps, just as the lack of moving money causes them now.

We truly believe you understand these basic facts and idly called your readers "fallacious" reasoners, when you merely intended to get their minds receptive to the fact that the more quickly capital goods demands increase, the more quickly general betterment follows. Which is correct. As soon as this confidence starts things moving it dispenses funds to consumers and profits would not start to come back unless consumers kept turning these funds in trade.

The problem of division of returns is one that industry will one day solve by a percentage dispersion of earnings to all workers and stockholders. Page 51, your own IRON AGE of June 13, 1935, gayly announces a monthly bonus by one company and states, "will be an example for other industries."

When all workers, including executives, engineers, office and shop, are working on adjusted salaries and rates of pay and a percentage of profits, based upon their indi-

vidual annual dollar earning capacity, we will have arrived at an industrial economic saneness.

HENRY W. WOLFF.

Editor's Note: There is much in Mr. Wolff's thoughtful comments to which we can take no exception. But we see no reason for modifying our statements of June 13. It is misleading to say that "consumer buying power is king." This concept has been at the basis of most of the New Deal experiments; it has resulted in huge Government expenditures designed to increase consumer buying. It has failed to produce expected results, because, though consumer purchases have risen, what has been spent has passed through business channels into the banks where it has piled up without being reinvested.

As is always the case in a profit and loss economy, there are two kinds of spending—what is expended for the necessities of life and what is spent or invested out of savings. Expenditures by business come out of savings. Business spending in turn creates employment and hence consumer buying power. To say that in this case consumer buying power comes first is to put the cart before the horse. So long as individuals and businesses have discretion as to what they will do with their savings, a large part of consumer buying power will depend not on the will of the consumer, but rather on the decision of the saver.

It is conceivable, theoretically, that in a time of deflation savers might continue to abstain from buying for so long that both savings and consumer buying power would be entirely wiped out. In other words, deflation is cumulative, begetting further deflation. As prices decline, forced sales depress prices further, and so on, until ultimately the creditor as well as the debtor may be wiped out. Our banking crisis of March, 1933, was really a reflection of far-reaching confiscation, through depression of values, of the savings of the nation.

It was for that reason that it was so important to halt the deflationary process. Before savers can be induced to invest, their savings must be protected from deflationary depletion or destruction. To say that savers will take no risks until enlarged consumer buying power insures a profit, is to oversimplify the complex manifestations of recovery. In the first place, many businesses, and individuals, too, for that matter, reach the point after a period of years when they have no alternative but to replace wornout equipment. This business, when it develops, creates employment and hence enlarges consumer buying power. The gain in general trade volume may create profits for someone, and hence encourage still further buying, provided political policies or other extra-business factors do not create offsetting fears. Thus we see that buying out of savings can be cumulative just as deflation is cumulative. Each gain in purchases out of savings *further* swells employment and does so, to a large extent, in the durable goods field, where unemployment has been most severe.

That is why a weekly capital goods index is important as a barometer. No claim has been made for it except that it is an excellent indicator which has not been previously available to American business.

Editor's Note: This is a series of observations which, strangely enough, are exactly what they purport to be. In other words, they come from the daily diary of a real boss; a prominent executive in the metal-working industry who prefers to remain an anonymous author.

The Boss's Diary

I got stuck today. This morning's newspapers were full of Wagner Bills, social legislation, new taxes and what not, but the undercurrent running through it all and popping up in every few paragraphs was a hint or a worry as to what was to become of the Constitution.

Here's where I got stuck. I couldn't remember the President's oath of office so I did what many a small-city executive should learn to do—I called up the local Chamber of Commerce and asked, "What is the oath of office of the President of the United States?" "Dear me, Mr._____," said a gentle voice, "I guess I'll have to look that up and let you know—I don't remember."

Well that made two of us who didn't remember. Then I went around the office and asked the first ten people I met the same question and none knew and that made twelve, so I looked it up and here it is in all its terse majesty. I nominate it as the shortest and weightiest contract of employment extant.

"I do solemnly swear (or affirm) that I will faithfully execute the office of President of the United States, and will to the best of my ability preserve, protect and defend the Constitution of the United States."

Only one person at a time out of some 120,000,000 people in these United States takes that oath, and how some 119,999,999 other people do desperately need to have that one person remember the full import of that oath in all its implications!

New developments in the oxy-acetylene process and their industrial applications will feature the annual convention of the International Acetylene Association, to be held at the Hotel Cleveland, Cleveland, Nov. 12-15.

Seaman Body Reeducates Workers in New Crafts

MORE than 300 workers at obsolete crafts have been reeducated into skilled operators at more modern trades through a comprehensive program of vocational rehabilitation inaugurated more than a year ago by the Seaman Body Corpn., Milwaukee, affiliate of the Nash Motor Co. The program was undertaken when the Nash company made a change in the type of body construction used on its cars, abandoning combination wood-and-steel bodies for the all-steel type. In this change-over, about one out of every three workmen in the body assembly division found their woodworking jobs abolished after spending, in some cases, 25 to 30 years at their trades.

These men, ranging in age from 24 to 69 years, faced the possibility of being let out to seek work at their crafts in other industries or going on relief. Few had money to pay for learning a new trade and most of them realized that woodworking jobs were being eliminated in other industries as well as in motor car manufacture. The Seaman Body Corpn., accordingly, undertook to organize and finance the reeducation of the woodworkers and allied craftsmen.

Called back in small groups, the men were told of what had happened in the changed manufacturing process. Through many years of close relationship among foremen, workers and superintendents, the management was able to guide the workers into lines of endeavor where their old training might be useful in new jobs. Wherever possible, men were given an opportunity to choose their new crafts. In many instances the first new trade selected did not turn out to be a wise choice. Where this happened, the factory foreman put the man on another job. This was repeated as many as six times in some cases before a man found a new job he could master.

The program called for the placing of skilled woodworkers among crews of trained workers as apprentices. The company paid them apprentice wages until the foremen were satisfied that their training was complete, at which time they received regular skilled operators' compensation. The time needed for reeducation varied from two to three days, during which gun, spot and flash welding techniques could be learned, to four weeks for arc and acetylene welding, two new trades to which many workers were transferred.

Most Men Have Adapted Themselves

With few exceptions the men have been able to adapt themselves to their new duties. The trades include upholstering, painting, trimming, soundproofing, wiring and many other minor operations in automobile manufacturing, in addition to welding. The new weekly and hourly wages are equivalent to their former pay levels at woodworking.

Commenting on the over-all effect of this program of rehabilitation, Harold Seaman, president of the company, points out the contradiction it affords to the theory that machines are enemies of men. "We have found that we have a greater need for workers because of the changeover from wood-and-steel bodies to all-steel. Some of the increased jobs come from creation of hitherto unknown tasks, such as sound-proofing and insulating. The greatest need for employees, however, is due to the reduced cost of the basic manufacturing processes, which in turn has enabled us to equip bodies with comfort and luxury devices that require a considerable amount of labor. Thus many workers in wood were transferred to divisions where ash trays, window ventilators, arm rests, radio antennae, luggage compartments and other features are built and attached to the bodies."

Over 70 per cent of the men reeducated were more than 40 years of age. One man 69 years old was successfully taught a new trade. "We have been unable to estimate the cost of this undertaking," said Mr. Seaman, "but we already know it has been insignificant in contrast to the improved morale and increased loyalty it has inspired among our workers."

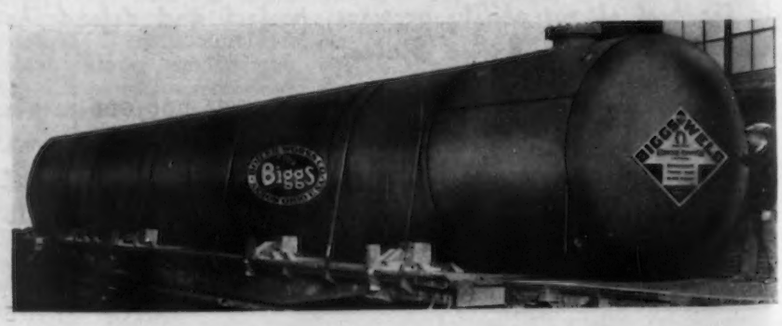
The same method of readjustment is being applied to the Nash company's Racine and Kenosha plants wherever new manufacturing methods eliminate tasks accomplished by skilled workers.

Large Welded Tank for Propane Gas Storage

THE propane tank here pictured, recently fabricated by the Biggs Boiler Works Co., Akron, Ohio, has capacity for storing 3600 cu. ft. of propane gas at 200 lb. sq. in. pressure. It is 8 ft. 10 in. in diameter, 67 ft. long and weighs 82,000 lb.

The tank was fabricated by the shielded arc welding process in accordance with requirements of the A.S.M.E. Code for unfired welded pressure vessel construction. Forty-one tons of a high-tensile carbon steel developed for pressure vessels went into its construction. This steel has a tensile strength of 70,000 to 82,000 lb. per sq. in., and a minimum yield point of one-half the tensile strength. It is made 2 in. and under in thickness. Analysis shows 0.32 per cent carbon, maximum, for plate ¾ in. and less in thickness and 0.35 per cent carbon, maximum, for thicknesses over ¾ in. Manganese is 0.90 per cent; phosphorus, 0.035 to 0.04; sulphur, 0.04 to 0.05; and silicon, 0.25 per cent.

All seams of the tank were butt welded under the special procedure control developed by the builder. The large heads, of one-piece construction, are 1 5/16 in. thick. When completed the tank passed a hydrostatic pressure and hammer test of 400 lb. Equipment made by the Lincoln Electric Co., Cleveland, was used in the welding.



THIS WEEK IN WASHINGTON

"NO, no, many thousand times no!" says Rhode Island, decisively rejecting the "more abundant life."

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Plan to take 3,500,000 off of relief rolls and put them on to relief work by Nov. 1 now seen as impossible accomplishment.

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Construction unions' strike against Government and demand for special relief privileges adds to President's problems.

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Aldrich joins exodus from Roper Advisory Council.

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BY L. W. MOFFETT
Resident Washington Editor, The Iron Age

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WASHINGTON, Aug. 13.—The New Deal is at grips with economic forces such as are rapidly bringing to a head the supreme test of its underlying philosophy of the more abundant life.... Potent demonstrations are forcing a showdown on the shuffle. ... Outstanding examples are developments of the past week:

The sharp rebuke given the New Deal by voters of the First Congressional District in Rhode Island; the biting by organized labor of the hand that has fed it so freely in striking against the security wages paid for relief work jobs; the vigorous attack of business on the share-the-wealth tax program.

Simmered down, these and collateral manifestations reflect growing revolt against the idea of reform before recovery.... They are a reflection of the confusion in the public mind arising from the jumbled mess growing out of the sweeping, undigested schemes hatched in Washington in its frenzied zeal for experimentation. ... Effort after effort has been launched only to crumble into nothingness, or worse, to destroy confidence.

The day of the emotional appeal, of melodramatic gestures and of fantastic ideals, it is to be hoped, has passed. ... As emphatically desirable as it is, it is perhaps too much to expect that the day of wisecracking, without regard to its source, is in the eclipse. ... Airy, casual and cavalier remarks do not solve the problem of unemployment and recovery.... And it is of these things that an increasingly realistic public mind is thinking. ... Fortunately, it is seeing a definite rise in industrial and business activity. ... Yet it sees little, if any, shortening of the alarmingly long line of unemployed. ... A phenomenon for which are offered several explanations, some of them rather tenuous. ... The length of this drab line is unknown, thanks to a helter-skelter unemployment relief policy, and it is seriously questioned if it can be determined even after the pending Federal-State unemployment insurance is put into effect, seeing that there is no plan apparently for registration, checking or placement and that the multiplicity of agencies, working at cross-purposes, has created confusion and lack of coordination.... The confusion appears to grow in ratio to the outpouring of millions upon millions in taxpayers' money, what with boondoggling entailing ludicrous enterprises, and a policy that too often smacks of positive antipathy and spite toward private industry.

Certain it is that under existing conditions of befuddled policies the Administration will fall far short of its announced goal, that of taking 3,500,000 off relief rolls and engaging them in relief work under the $4,800,000,000 fund by Nov. 1. ... Even under a definite policy this would be a gigantic task in view of encouragement given to the dole complex and "why work" idea ... important items in the theory of "the more abundant" life.

The Rhode Island Vote

Getting to the Rhode Island vote, its political implications probably are profoundly significant, and cannot be lightly dismissed, New Dealers to the contrary notwithstanding ... though it might well be that the opposition has overstated its importance. ... But it assuredly looks as though the vote were a challenge

of the New Deal's relief program and therefore of real economic significance. . . . The supposed tremendous favorable possibilities of the $4,800,000,000 fund appear to have missed fire. . . . Instead it would seem it has in it a serious political pitfall. . . . For with the vote sending a Republican to Congress went a State-wide vote against all save a few minor PWA projects. . . . The offer of a Government grant of 45 per cent of the cost did not beguile the Rhode Island voter. . . . Awakened to the fact that no matter what its source, Federal or otherwise, the taxpayer has to repay the money, Rhode Island voters turned down the proposed bond issue to finance the projects. . . . The vote favored a small relief fund at the hands of the Federal Government as necessary for the destitute . . . as for mere spending, extravagance, the voters definitely turned thumbs down.

The sedulous theory that public money, without limitation, would be used to provide employment on a standard that would assure the "more abundant life" is held to be largely responsible for the shameful strike inaugurated by organized labor on relief work projects in New York. . . . Tongue in cheek, President William Green of the American Federation of Labor, bringing out his usual "fear," was apprehensive that the strike might spread over the country, as he witnessed this expected move, of short duration, at some points. . . . Washing its hands of responsibility for the so-called unauthorized strike, the A. F. of L. did not relieve the sorry spectacle. . . . Nor was its ominous character relieved by the President in terming it not a strike, but a return of the relief workers to their homes. . . . Instead of accepting with gratitude the security wage, inasmuch as half a loaf is better than no bread, organized labor turned on an Administration that has given to it with a free hand, and that may be one of the difficulties. . . . The more it gets, the more it demands. . . . It forgets the 99 favors shown it and remembers the one denied to it. . . . The plea of its benefactor, Hugh S. Johnson, to call off the strike and return to work went unheeded. . . . Thus another problem was piled on the President's heavy load, and it is to be hoped he sticks fast to the policy that those who refuse work will be given no Government aid. . . . Shutting off the dole where it is justified, regardless of political reaction, will be an effective counter-irritant toward purging the relief rolls and discouraging the "why work" idea that has implanted itself in the minds of the parasitic. . . . It is an economic issue that has acutely projected itself before the Administration.

Drive Against "Soak the Thrifty" Program

Coming along with these vexatious problems, business and industry consolidated their forces and made an intensified drive against the share-the-wealth tax program. . . . Chiefly through spokesmen from the Chamber of Commerce of the United States, witnesses before the Senate Finance Committee made a smashing attack on the Administration's feeble tax measure, widely accepted as a political, vote-getting gesture which would raise barely enough money to meet the orgy of Governmental spending for three weeks. . . . It was evident that business meant business. . . . For it assailed the program hip and thigh, tearing it to threads, phase by phase. . . . It was a sharp thrust and may bear fruit.

In the Senate, Senator Vandenburg devastated the plan for excessive inheritance taxes. . . . In a clear demonstration he showed how the suggested rates would destroy the Ford Motor Co., and other one-family-owned concerns, whose stock would be shared with the public, according to the conception of Robert H. Jackson, counsel for the Bureau of Internal Revenue. . . . Senator Vandenburg told the Senate that the inheritance taxes would drive the Ford Motor Co. "into the hands of Wall Street or its equivalent; and the money changers, who have striven vainly in years past to achieve this end, and whom this Administration says it proposes to drive from the temple, will have been handed the dominion which in no other manner could be obtained."

Ellsworth C. Alvord, former tax lawyer for Congress and the Treasury, attacked the excess profits tax, proposed by the capricious, inequitable and uncertain "and as penalizing conservatively managed enterprises and discriminating against them in favor of inflationistic corporate finance." . . . As sound as was Mr. Alvord's reasoning, and as unfair as are the proposed excess profits taxes, it is generally conceded that the House, in incorporating this proposal, made an improvement over its original plan of simply levying taxes on the basis of the size of a corporation rather than on its net income. . . . Despite the Administration's contentions for taxes on bigness, there is a shift, even a possible rebellion, against the idea, and the bill as it finally emerges promises to be quite different from that proposed by the Administration.

Business Advisors Not Heeded

Revolts continue to break out in the Roper Business Advisory Council. . . . Business men named on this body were supposed to give advice to the Administration. . . . But the impression has become quite definite that the Administration does not want their advice. . . . Apparently it is only seeking approbation. . . . Hence the report that recommendations, with possibly one or two exceptions, have been tossed into the waste basket, showing more clearly the cleavage between business and the Administration—another economic problem the Administration faces, ignore it though it would if advice of some brain trusters were heeded. . . . The latest in the series of resignations from the council was that last week of Winthrop W. Aldrich, chairman of the Chase National Bank, who politely gave his reason as being pressure of "other obligations." . . . Mr. Aldrich's marks the sixth resignation in recent weeks from the council. . . . Secretary of Commerce Roper outwardly is complacent. . . . He said he found no special significance in the resignation and declared that there is not the slightest possibility of the council breaking up.

After heated debate in which opponents poured withering scorn on the idea of the Government repudiating its promise, Administration forces last week succeeded in pushing through the President's so-called gold bill prohibiting, six months after its enactment, suits against the Government because of dollar devaluation. . . . Consistent with the devaluation act itself, the measure was attacked as breaking the solemn pledge of the Government to guarantee the right of investors. . . . It is said to have been responsible for the resignation of John G. Laylin, assistant general counsel of the Treasury. . . . Mr. Laylin is reported to have written a scorching letter of resignation to the Secretary of the Treasury, saying he (Mr. Laylin) would have no part in the program of repudiation. . . . Senator Vandenburg of Michigan was authority for the statement that such a letter was written by Mr. Laylin.

The House and the Senate are air-conditioned . . . not simply hot-air-conditioned, believe it or not . . . which may explain the long-winded session now still under way, punch drunk but still blowing gas. . . . And now the entire capitol is to be air-conditioned through an appropriation of $2,500,000 voted last week in the second deficiency bill.

Bids Submitted On Naval Vessels

BIDS submitted last Wednesday by shipbuilders on one aircraft carrier, one light cruiser, three submarines and eight destroyers are being studied by the Navy Department prior to making awards. On the aircraft carrier, the Newport News Shipbuilding & Dry Dock Co., Newport News, Va., was low at $24,434,000 on the straight proposal, while the Bethlehem Shipbuilding Corpn., Quincy, Mass., was low at $20,812,000 on the alternate bid containing the provision for adjustment. On the cruiser, the Newport News Shipbuilding & Dry Dock Co., was low on both the straight and alternate proposals at $15,525,000 and $13,500,000 respectively. The Electric Boat Co. was the only bidder on the three submarines at $3,587,000; $2,977,000 and $2,727,000 each for one, two or three vessels respectively. Bids on the three 1850-ton and five 1500-ton destroyers were so complicated that it is expected to require considerable time to study them before making awards.

Bill Would Authorize 24 Bridges

THE House Committee on Foreign and Domestic Commerce has made a favorable report on the so-called omnibus bridge bill to authorize the construction of 24 bridges, some of them large structures calling for heavy steel requirements. The largest bridge authorized under the bill is one proposed to be constructed across Chesapeake Bay between Baltimore and Kent counties, Maryland, and would cost at least $10,000,000. Other bridge projects included in the bill are: Delaware River, between Easton, Pa., and Phillipsburg, N. J.; Potomac River, Old Town, Md., and Green Spring, W. Va.; Ohio River at Sisterville, W. Va.; Mississippi River at New Boston, Ill.; Missouri River at Rulo, Neb.; Monongahela River at Elizabeth, Pa.; Allegheny River at Port Allegany, Pa.; Allegheny River at Ford City, Pa.; Puget Sound at "The Narrows," Washington; Mahoning River at Edinburg, Pa.; Susquehanna River at Wyalusing, Pa.; Ohio River at Owensboro, Ky.; Allegheny River at Emlenton, Pa.; Allegheny River at Tionesta, Pa.; Allegheny River at East Brady, Pa.; Lake Champlain at West Swanton, Vt.; Tennessee River between Florence and Sheffield, Ala.; Potomac River at Dahlgren, Va.; Mississippi River at Stites, Ill.; Ohio River at Shawneeton, Ill.; Lake Champlain, between Rouses Point, N. Y., and Alburg, Vt.; Gulf of Mexico, between Cedar Point and Dauphin Island, Ala.; Ohio River at Cannelton, Ind.; Tennessee River, between Dayton and Decatur, Tenn.; Missouri River at Arrock Rock, Mo.; Columbia River at Astoria, Ore.; Ohio River at Louisville, Ky.; Saint Clair River at Port Huron, Mich.

Walsh Bill Soon To Be Enacted

PASSAGE of the Walsh bill Monday by the Senate indicates that it soon will be enacted into law. It was predicted that the House will act on the measure soon, perhaps this week, after which it will be sent to the President for signature. The measure was sponsored by the Administration and supported by the American Federation of Labor. It requires that contractors and suppliers in connection with Government projects and work shall adhere to code wages and hours.

The only important amendment made in the Walsh bill was one offered by Senator Clark limiting its operation to two years instead of three. The amendment was adopted by a vote of 51 to 33.

Guffey Bill Voted By Narrow Squeak

BY the narrow margin of 12 to 11 the House Committee on Ways and Means on Monday voted favorably to report the Guffey coal nationalization bill. Chairman Doughton of the committee said that he doubted if the bill can be brought up in the House before Thursday, and Patrick Boyland of Massachusetts, Democratic whip, stated that a check showed that if the bill passes the House it will be by a margin of less than 20 votes. After passing the House, if it does pass that body, the bill will be sent to the Senate. It barely escaped an unfavorable report of the Ways and Means Committee.

The bill has been changed in several respects from its original form. The provision authorizing a $300,000,000 appropriation for the Government to purchase marginal coal lands has been eliminated. The proposed tax of 25 per cent of the value of the coal at the mouth of the mine has been reduced to 15 per cent as a penalty for selling below minimum prices. The drawback allowed when not selling below cost has been reduced from 99 to 90 per cent. The committee also set up a consumers' council to act in an advisory capacity.

West Leechburg to Add Cold Strip Mill

WEST LEECHBURG STEEL CO., Pittsburgh, has purchased a new four-high cold strip mill from the United Engineering & Foundry Co. The mill is designed to roll strip up to 28 in. in width and will have a capacity of about 4000 tons a month. The bearings for the mill will be supplied by the Timken Roller Bearing Co., and electrical equipment will be furnished by the Westinghouse Electric & Mfg. Co. Complete installation will cost approximately $300,000. Operation of the mill is expected on Nov. 1.

Details Given on New Carnegie Mill

THE new mill to be erected by the Carnegie Steel Co. at Homestead, Pa., will be a 100-in. semi-continuous, electric-driven, sheared plate mill, located between the present 110-in. (Liberty mill) and the Pittsburgh & Lake Erie tracks, West Homestead, Pa., covering an area of approximately 300 by 1800 ft. over all, with a floor area under roof of 404,210 sq. ft. (approximately 9¼ acres).

The mill will consist of the following:

Four continuous-type reheating furnaces

One 36 in. x 200 in., two-high, non-reversing scale stand

One 42 in. and 52 in. x 120 in., four-high, spreading stand

One slab squeezer

One 36 in. and 54 in. x 100 in., four-high, reversing roughing stand with vertical edging stand

Four 27 in. and 54 in. x 100 in., four-high, continuous finishing stands, with shears and normalizing equipment.

The average slab used by the mill will be 54 x 6 x 90 in. and the finished product will measure 20 in. to 90 in., inclusive, in width by 3/32 in. to ¾ in., inclusive, in gage. The product will range from standard carbon steel to high-tensile steels, such as United States Steel Corpn. Cor-Ten, Man-Ten and Sil-Ten. The rated capacity of the mill is 728,900 gross tons per year.

Steel Survey Staff Set Up Headed By Shannon

WASHINGTON, Aug. 13.—The staff which is to make a survey of the iron and steel industry under the direction of Deputy Administrator R. W. Shannon has been virtually completed. Included in additions to the staff since announcement of the survey was made in THE IRON AGE of July 18, page 53, are Arthur Sturgis and H. L. Brunson of the labor section, Division of Review; Burr Tracy Ansell and John E. Skilling of the legal section and Charles F. Marsh, economist. Messrs. Sturgis and Brunson will make a study of labor conditions. Mr. Ansell will study competition conditions and Mr. Marsh will act as general liaison with the statistical section.

Mr. Sturgis graduated from the engineering school of Harvard University with a B. S. degree in electrical engineering. In the past he has been engaged by labor organizations in work of arbitration and wage negotiations. Among organizations which he has represented are the railroad brotherhoods, steel railway unions and the United Mine Workers. Mr. Brunson also has been active for many years in arbitration work.

Mr. Ansell was a legal representative of the committee on the basing point study, and is a graduate of Harvard University. Mr. Skilling also is an attorney, associated with NRA, and is a graduate of Harvard University. Mr. Marsh is associated with the faculty of William and Mary College, Williamsburg, Va.

The survey staff will gather material for its study from various Government departments and bureaus, private organizations and trade journals and will consult members of the iron and steel industry, the American Iron and Steel Institute, engineers, labor experts, the Amalgamated Association of Iron, Steel and Tin Workers, the staff for Steel Code Study of the University of Pittsburgh and the Brookings Institution.

Like other studies being made by the Division of Review of the NRA, the report is to be made to the President by Dec. 1. While the executive order calling for the studies does not specifically call for it, it is reported that the legislation might be proposed on the strength of findings.

Administration Pleased With Security Bill

WASHINGTON, Aug. 13.—The Administration was greatly pleased with passage of what has been called its ace reform measure, the unwieldly omnibus social security bill, to be administered by board of three and providing for old age pensions, unemployment insurance and public health aids. The underlying idea of the legislation has been accepted as sound by industry generally, though attacks have been made on some of the provisions which will mean a high cost to industry.

The bill calls for pensions for needy persons over 65 on a fifty-fifty basis with the States, the Government contributing up to $15 monthly; contributory old age pensions for industrial employees over 65 years of age, to begin in January, 1942, and pensions, based on the wages earned after January, 1936, to range from $10 to $85 monthly; unemployment insurance, State administered, with Federal aid, for employees of eight or more persons for any 20 weeks in the year; pensions for the needy blind on a fifty-fifty basis between States and the Government, ranging up to $15 monthly; and Federal aid to dependent mothers, children, etc. The breadth of the program is indicated by the fact that there are at present more than 7,500,000 persons 65 years or older in the United States, though old-age pensions would be given only to those in need and those living in the 33 States which pay pensions to old people. . . . Estimates have been made that by 1950 approximately 25,000,000 workers would be embraced in the national compulsory contributory pension plan for persons under 65, the plan to be financed equally by employers and employees, with each ultimately paying 3 per cent of the employees' income into a Government fund. The tax yield by 1950 is estimated at about $2,000,000,000 annually, while by 1980 it is estimated the fund would attain the tremendous total of $50,000,000,000. It is required that a worker retire as a means of receiving a pension and it is necessary that he had received a minimum of $2,000 in wages.

The working of the plan is shown by a report on the bill as follows:

Average Monthly Salary	Pension per Years of Employment 10	20	30	40
$50	$17.50	$22.50	$27.50	$32.50
100	22.50	32.50	42.50	51.25
150	27.50	42.50	53.75	61.25
200	32.50	51.25	61.25	71.25
250	37.50	56.25	68.75	81.25

Additional legislation will be enacted, probably at the next session of Congress, for application of the compulsory provisions of the old age pension plan and will exempt from taxation employers and employees operating under private pension systems. The Senate approved this provision, but it was rejected in conference. Details of the plan will be worked out by a joint Congressional committee. A health insurance provision probably will be added to the legislation at next session.

Being necessary to get State cooperation in order to put the act into full force, the act offers attractions such as a provision allowing 90 per cent credits to employers from the 3 per cent unemployment insurance payroll tax where contribution is made to State job insurance systems by local industries. The unemployment insurance tax is paid to the Federal Government, but States are wholly charged with establishing unemployment insurance plans, the States to be given their choice of plans.

Industries Ask for Trade Practice Agreements

WASHINGTON, Aug. 13.—Announcement was made last week by the Federal Trade Commission that 20 industries have formally asked the commission to sponsor trade practice agreements. They have completed all necessary preliminary arrangements looking to negotiation of agreements. Among the industries are the following: Steam heating boiler; wire, rope and strand; asbestos; asphalt shingle and roofing; corrugated and solid fiber container.

The commission said it will be glad to receive suggestions or representations, either in writing or in person, from any parties having an interest in the proposed agreements for the affected industries.

NEWS OF THE WEEK

General Motors to Spend $50,000,000 for Improvements

FIFTY MILLIONS of dollars will be spent by General Motors Corpn., largely for capital equipment in the form of machinery, according to an announcement by Alfred P. Sloan, Jr. While some of this will be allocated to improving plants overseas, the bulk of the appropriation will be applied to plants in this country and will particularly stimulate the American machine tool industry.

"While there will be a limited amount of building construction," said President Sloan, "the greater part of the program involves the purchase of machinery and other plant equipment directly involved in production. It will be recognized that this program will make a contribution to employment, as affecting the capital goods industries, and many communities in which General Motors operates should ultimately benefit by the increased employment in prospect."

In addition to the new transmission plant at Muncie, Ind., and plant construction at Saginaw, Mich., now being carried on, projected improvements include new factories for the Pontiac and Fisher Body divisions at Pontiac, Mich., costing $3,500,000; modernization work for the Buick and Chevrolet plants at Flint, Mich.; modernization of the Durant plant at Lansing, Mich., which has been purchased for the Olds division; refitting of the Murray Wood Products plant at Memphis, which has been bought for the Fisher Body division; a new plant for the Allison Engineering division at Indianapolis, where airplane engines will be manufactured, and a new plant at McCook, Ill., for the Electro-Motive division, which will build Diesel-electric locomotives on a continuous assembly basis.

Ford Blast Furnaces Modernized

BLAST furnace modernization at the Rouge plant of the Ford Motor Co. at Dearborn, Mich., to increase daily iron production at the plant by 300 tons has been completed, officials stated today.

The modernization, which cost $580,000, is part of a $20,000,000 expansion program which will provide additions and replacements in nearly all parts of the plant.

Blast furnace B has been enlarged and rebuilt, increasing its capacity from 500 to 800 tons of pig iron a day. Similar improvements to furnace A were made in 1933, its capacity being increased from 600 to 800 tons a day.

Reconstruction work was begun on furnace B in February. Its new hearth diameter is 18 ft. 6 in. as compared with 17 ft. before. The diameter of the top has been increased from 16 ft. 2 in. to 18 ft. 3 in. Cost of the work was $150,000. In addition, three stoves for furnace A have been rebuilt at a cost of $180,000, and new electric gas precipitators for gas cleaning on both furnaces have been built at a cost of $250,000.

Turbo blowers capable of sending 80,000 ft. of air a minute into the furnaces were installed in 1933. The new precipitators will clean gas to a point at which it will have but 0.01 grains of foreign substance to the cubic foot remaining. The gas thus will be made available for use anywhere in the Rouge plant, although 25 per cent of it will be utilized at the furnaces, reheating air blast. The furnaces have an output of about 140,000 cu. ft. of gas for each ton of iron produced.

Reconstructed furnace B will receive about 120 charges a day. Each charge includes, in approximate amounts, 12,000 lb. of coke, 24,000 lb. of iron ore and 5000 lb. of limestone. In a 24-hr. day total charges will weigh approximately 5,000,000 lb. The furnaces will be loaded from the present skip, which has a capacity of 200 cu. ft. Metal will be cast on an average of six times daily.

Iron from one furnace will feed the open-hearth furnaces, which supply the steel for the steel rolling mills which are being enlarged at a cost of $10,000,000.

Iron from the other furnace will supply the foundry for the manufacture of castings.

World Production Continues to Rise

WORLD production advanced further during the month of June, according to the regular monthly statement of the National Industrial Conference Board. Increased activity occurred in all of the major countries except France, Holland, Switzerland, Chile and Canada. Building activity in England continued to increase; for the month of May, the volume of construction was 121 per cent above the average for 1924 and 67 per cent above that for 1929. Production in Canada in June was approximately 4.8 per cent higher than a year ago, against an increase of 2.5 per cent in the United States over the same period. Japanese output continued to expand, but at a constantly declining rate.

The following table shows the increase in production during the first part of 1935 and during the

past 12 months for the more important countries.

Country	Month	Percentage Change Since December, 1934	For Past Twelve Months
Canada	June	+ 9.6	+ 4.8
Germany	"	+12.0	+17.1
Great Britain	"	+ 2.7	+ 4.6
United States	"	nil	+ 2.5
Chile	May	+ 5.6	+17.7
France	"	nil	— 7.9
Italy	"	+26.6	+26.9
Netherlands	"	— 2.6	—11.0
Sweden	"	+ 5.2	+ 8.2

Amtorg Increasing Machinery Purchases

ORDERS placed by the Amtorg Trading Corporation in the month of July totaled $6,000,000, this being the largest volume of purchases in any one month for several years. About 75 per cent of the purchases in July was accounted for by metal-working machinery and equipment.

In the past two months Amtorg has made purchases of machine tools, foundry equipment and dies to the value of almost $6,000,000. Such orders have been placed with about 75 companies, with 15 firms receiving orders in excess of $100,000.

The largest recent orders in the machine tool group have been placed with the following companies: Farrel-Birmingham Co., Pratt & Whitney Co., Niles-Bement-Pond Co., Gleason Works, Cincinnati Milling Machine & Cincinnati Grinders, Inc., Cone Automatic Machine Co., Ingersoll Milling Machine Co., Norton Co., National Automotive Tool Co., Greenlee Bros., National Machinery Co., National Acme Co., Heald Machine Co., Gisholt Machine Co., Gould & Eberhardt, Oilgear Co., Landis Tool Co., Waterbury-Farrell Co., Koestlin Tool & Die Corpn., Richard Bros., Toledo Machine Tool Co., Baird Machine Co., William K. Stamets.

Properties of Malleable Iron

IN D. P. Forbes' article on the properties of malleable iron, which appeared in THE IRON AGE on April 4, an iron was described on page 45 as having a tensile strength of 90,000 lb. per sq. in., a yield point of 70,000 lb. per sq. in. and an elongation of 16 per cent in 2 in. This elongation was an error and should have read 6 per cent in 2 in.

Steady Upturn Features British Iron and Steel

LONDON, ENGLAND, Aug. 13 (*By Cable*).—British pig iron makers are heavily sold up to the end of the year and an increase in the production rate in the fall seems unavoidable. Foundry iron prices are expected to advance shortly. Business in foreign semi-finished steel has been resumed but the tonnage is small. Domestic works are heavily booked, although curtailing for the holidays.

The present output of billets is unequal to any sudden expansion in demand. There is steady domestic business in finished steel, particularly structural and rails. The plate outlook is also better due to shipyard activity. Steel exports are improving, with substantial orders being received for heavy plates and sections from Scandinavia, South Africa and Canada. China has ordered rolling stock to the value of £265,000 and Australia has ordered electrical equipment amounting to £300,000.

Tin plate mills have resumed after a week's holiday and production is expected to soon reach 50 per cent of capacity. Present backlog is 2½ million boxes. Home demand is quiet but inquiry is good. Exports are improving, with fair orders from Argentina, Belgium and Holland.

Import duties have been reduced to 20 per cent ad valorem for five months, in accordance with the five-year agreement that has been signed by the United Kingdom with the Continental Iron and Steel Cartel, limiting United Kingdom imports of cartel products to 670,000 tons during the year beginning Aug. 8, and 575,000 tons per annum for the four subsequent years. A complete export agreement must be reached before the end of this year. The result of the reduction has been to stimulate the Continental business somewhat. Other markets are also improving, possibly in anticipation of price rises. Orders are fair for bars, plates and thin sheets, but Continental business in thick sheets, plates and shapes is dull.

Byers to Make Steel Pipe

A. M. BYERS CO., Pittsburgh, maker of wrought iron since 1864, has just announced to the trade the third major expansion project for this company in recent years, its entry into the steel pipe field.

Several years ago Byers completed the largest wrought iron mill in the country at Ambridge, Pa., for manufacturing wrought iron under a new process. Following this, the operations were further expanded to include the reintroduction of a wide range of wrought iron products which includes plates, sheets, merchant bars, angles, structurals and forging billets.

The last step in broadening the sales and manufacturing activities of the company was taken when it was announced that steel pipe would be manufactured in addition to the present complete line of wrought iron products. Byers steel pipe will be made in the company's pipe mills under the same executive supervision as exists on wrought iron pipe.

British Prices, f.o.b. United Kingdom Ports

Per Gross Ton

Ferromanganese, export	£9
Billets, open-hearth	£5 10s. to £5 15s.
Tin plate, per base box	*18s. 2d. to 18s. 7½d.*
Steel bars, open-hearth	£7 17½s.
Beams, open-hearth	£7 7½s.
Channels, open-hearth	£7 12½s.
Angles, open-hearth	£7 7½s.
Black sheets, No. 24 gage	£9 5s.
Galvanized sheets, No. 24 gage	£11 5s.

*To Nov. 1: 18s. 5d. to 18s. 10½d. thereafter.

Official Continental Prices, f.o.b. Continental Ports

Per Metric Ton, Gold £

Current dollar equivalent is ascertained by multiplying gold pound price by 124.14 to obtain franc equivalent and then converting at present rate of dollar-franc exchange.

Billets, Thomas.	£2 7s.
Wire rods, No. 5 B.W.G.	£4 10s.
Steel Bars, merchant	£3 5s.
Sheet bars	£2 8s.
Plate, ¼ in. and up	£4 2s. 6d.
Plate, 3/16 in. and 5 mm.	£4 4s. 8d.
Sheets, ⅛ in.	£4 9s. 8d.
Beams, Thomas.	£3 2s. 6d.
Angles (Basic)	£3 2s. 6d.
Hoops and strip base	£4 2s. 6d.
Wire, plain, No. 8	£5 7s. 6d.
Wire nails	£5 15s.
Wire, barbed, 4 pt. No. 10 B.W.G.	£8 15s.

Inland Fights I. C. C. Ruling

INLAND STEEL CO. has filed suit in the Federal court asking for an injunction against both the Interstate Commerce Commission and the Indiana Harbor Belt Line prohibiting them from enforcing a recent ruling by the commission which orders the railroad to discontinue "switch rebates." The practice in question is one of long standing in which railroads have paid big shippers for switching done by the shippers in their own yards.

Sharp Gain in Farm Equipment Output

PRODUCTION of farm machinery for the domestic wholesale market in 1935 is expected to reach a total of $320,000,000. This figure is based on an improvement over 1934 output to date of about 70 per cent. Sharp advances in the first six months of this year are continuing unabated. Sales in the wholesale market in 1934 aggregated approximately $200,000,000, or about one-half of the 1928-1930 average which was $414,000,000.

The greatest single factor in the 1935 advance is the sale of tractors, which normally account for from 35 to 40 per cent of the total volume of farm implement sales. However, this year tractor sales have been running close to 60 per cent of the total.

Canadian Market Loses Buoyancy

TORONTO, Ont., Aug. 13.—Rolling stock contracts for which bids were asked several weeks ago have not been placed, although action in this respect is looked for within the next week or two. The mining industry is furnishing a fair demand for steel and machinery, but buying by the automotive industry has dropped sharply. The sheet mills in the Hamilton district are running at full time and the Steel Co. of Canada, Ltd., still is well behind with shipments. While there has been some improvement in building trades, the betterment mostly has been in construction of dwellings and no large projects have been announced, with the result that there is very little demand for structural shapes at this time.

Merchant pig iron sales have tapered, with awards for the week below 600 tons. Individual sales for the week were confined to single car lots with no inquiries for large tonnage lots or future delivery. The daily melt, however, is holding around 45 per cent of capacity. Pig iron production also is sustained, with output in excess of 45,000 tons per month and three stacks blowing. Prices are firm and unchanged.

Scrap markets are following the lead of activities in other branches of the steel industry. While odd shipments of heavy melting steel are being made to the Hamilton district, sales are running below the average for the year. Price lists are unchanged, but dealers are offering from 25c. to 50c. a ton above list for desirable lots.

Output Higher In South

BIRMINGHAM, Aug. 13.—For several weeks there has been a gradual upward trend in general demand for steel. The farm trade is better, as dealers and jobbers prepare for the usual fall pickup. Consumer buying has also started in the farming sections, with the crops laid by, and the outlook for sheets and wire products during the next several months is said to be encouraging. The market for heavy steel is still irregular. Grade separation projects, which are expected to absorb considerable steel tonnage, have been slow in getting under way and not much has yet come from them.

In the past two weeks there has been an increase of two active openhearths, nine now being in operation. At Fairfield, the Tennessee Coal, Iron & Railroad Co. increased from five to six on Aug. 6, while on Aug. 2, as previously reported, Gulf States Steel Co. added a third unit at Alabama City. The schedule for the current week also calls for nine.

Pig iron buying continues largely on a spot, small-lot basis, but the daily flow of new business has been fair and it is thought that August shipments will be larger than those of July. Five furnaces are in blast, no changes having occurred since the first of the month.

Pressure pipe demand is still restricted on account of the slowness of PWA and WPA projects. Business from the WPA has been negligible. United States Pipe & Foundry Co. has booked 600 tons from Roseville, Cal., and about 1000 tons from Guthrie, Okla.

The scrap market is sluggish. There is a fair demand for No. 1 cast but hardly any for steel grades. Most of the grades are inactive and prices in many instances are only nominal, pending a resumption of demand.

Cape Cod Canal Bridge Awarded A.I.S.C. Plaque

BOURNE, MASS., Aug. 15.—A stainless steel plaque, designating it as the most beautiful monumental steel bridge built last year, was attached to the highway bridge across Cape Cod Canal here today. The plaque was awarded by the American Institute of Steel Construction and was presented by Charles N. Fitts of New England Structural Company, a director of the Institute. It was received by Colonel John J. Kingman, Corps of Engineers, U. S. Army, representing the owners.

State Wagner Bill Is Killed

A STATE labor disputes bill, modeled after the national Wagner labor act, was killed in Wisconsin recently when Democrats combined with Republicans in the State Senate and voted down the Severson and Sigman bills, duplicate measures, by a vote of 17 to 15. Among opponents of the bills, Senator Joseph Clancy, Democrat, declared that such legislation would further restrict industry in Wisconsin and add to the forces that are causing businesses to move to other States.

WPA Fund Approved For Michigan Grade Crossing

THE President has approved a WPA allotment of $6,765,197 previously apportioned by the Secretary of Agriculture to Michigan for elimination of hazards at grade crossings in 27 counties in the State. This allotment covers the entire amount earmarked to the State from the $200,000,000 fund set aside for grade-crossing projects in the 48 States.

Forging Billets Advanced

EFFECTIVE Aug. 20, Republic Steel Corpn. announces a price advance of $3 a gross ton to $35 base at the various basing points on forging quality carbon steel billets.

The extras on forging quality billets also will be changed effective Aug. 20 as follows:

6 in. x 6 in. to 9 in. x 9 in. inclusive, or rectangles of equal area—base.

Under 6 in. x 6 in. to 5 in. x 5 in. inclusive, or rectangles of equal area —$2 per gross ton extra.

The extras for sizes larger than 9 in. x 9 in. remain unchanged. The extras for chemistry, restricted chemical requirements, cutting to length, etc., also are unchanged.

Sizes under 5 in. x 5 in. down to 4 in. x 4 in., which heretofore have been included in the forging billet classification, will hereafter be classified as bars and sold at bar prices.

This change in price, according to the official announcement, is made necessary due to the fact that in many cases the company has been called upon to furnish billets under 6 in. x 6 in. to the same exacting restrictions as to quality, surface, tolerances, etc., as are applicable to bar steel, with the result that it has been practically impossible to meet many of the requirements without supplying bar mill product on these smaller sizes.

Pipe Lines

Continental Oil Co., Continental Oil Building, Denver, Colo., is planning new 6-in. welded steel pipe line from oil field district near Wichita, Kan., to Denver, about 475 miles, for crude oil supply for refining plant at last noted place, totaling over 20,000 tons of pipe.

General Purchasing Officer, Panama Canal, Washington, asks bids until Aug. 26 for 58,100 ft. galvanized steel pipe and 3000 ft. black steel pipe. Also 5000 ft. cast iron water pipe (Schedule 3080).

Peoples Natural Gas Co., 545 William Penn Way, Pittsburgh, plans new 6-in. welded steel pipe line across Kiskiminetas River, between Westmoreland and Indiana Counties, Pa., replacing a present 8-in. and 4-in. line, for natural gas service. Application for permission has been made.

British-American Oil Co., First National Bank Building, Oklahoma City, Okla., plans 6-in. welded steel pipe line from oil field district to point near city, about 11,000 ft. Cost over $25,000. E. D. Hill, Insurance Building, is consulting engineer.

Whitney-Nashville Waterworks Co., Whitney, Idaho, plans about 7000 ft. 3-in. 2000 ft. 2-in., and 800 ft. 1½-in. steel pipe for water supply lines. Financing is being arranged through Federal aid. C. H. Gunderson is engineer.

Phillips Petroleum Co., Philtower Building, Tulsa, Okla., has let contract to Naylor Pipe Co., Chicago and Tulsa, for about 20 miles 24-in. fabricated steel plate pipe, totaling 3050 tons; and to Wyatt Metal & Boiler Works, Dallas, Tex., for 550 tons of other steel pipe, for new welded pipe line in oil field district.

Alco Products, Inc., Dunkirk, N. Y., subsidiary of American Locomotive Co., New York, has secured contract from Buffalo for about 10,000 ft. 36-in. welded steel pipe line, to be used for trunk main water service.

Chicago, 315 tons, to Taylor Forge & Pipe Works.

United States Engineer, Zanesville, Ohio, will take bids Aug. 27 for approximately 12 miles or 1700 tons of 12¾ to 20-in. steel pipe for replacing pipe lines of the East Ohio Gas Co. in connection with the Muskingum Conservancy district project.

Cast Iron Pipe

Price, Utah, will open bids Aug. 16 on 1250 tons of 12-in.

Cherokee, Iowa, plans pipe lines for water supply. Also elevated steel tank and tower, and other waterworks installation. Financing is being arranged through Federal aid. Buell & Winter Engineering Co., Insurance Exchange Building, Sioux City, Iowa, is consulting engineer.

Miami Water Co., Miami, Fla., plans pipe lines for water supply in part of city not being served at present time.

Newark, Ark., plans pipe lines for water supply. Fund of $58,000 is being arranged through Federal aid for this and other waterworks installation. W. F. Moody & Co., Little Rock, Ark., are consulting engineers.

Williams Bay, Wis., asks bids until Aug. 22 for quantity for water main extensions. F. M. Van Epps is village clerk.

Ghent, Ky., plans about 11,000 ft., various sizes, for water supply. Also 75,000-gal. steel tank on 100-ft. tower, pumping machinery and other waterworks equipment. Financing is being arranged through Federal aid. J. S. Watkins, Citizens Bank Building, Lexington, Ky., is consulting engineer.

Mount Olive, Ill., closes bids Sept. 4 for pipe lines for water supply and other waterworks equipment. Cost about $115,000. Financing has been arranged through Federal aid. Warren & Van Praag, Inc., Milliken Building, Decatur, Ill., are consulting engineers.

Torrance, Cal., plans pipe lines for extensions in water system. Cost about $64,000. Financing is being arranged.

Bloomington, Idaho, plans about 16,800 ft. 6-in., for main water supply, and 20,940 ft. 6- to 1-in., for distribution system. Robert G. Harding, Bountiful, Utah, is consulting engineer.

Fairfax, Okla., plans pipe lines for water supply. Fund of $144,000 is being arranged through Federal aid for this and other waterworks installation. V. V. Long & Co., Colcord Building, Oklahoma City, Okla., are consulting engineers.

Washington County Board of Supervisors, Abingdon, Va., soon takes bids for about 22 miles for main gravity flow line for water supply. J. B. McCrary & Co., Inc., Atlanta, Ga., is consulting engineer.

Westfield, N. Y., plans pipe lines for water supply. Fund of $54,000 is being arranged for this and other waterworks installation, including new reservoir. Alexander Potter, 50 Church Street, New York, is consulting engineer.

Upland, Cal., plans quantity of 12- and 6-in., for main water line service. Fund of $65,000 is being arranged for this and other water system improvements. R. G. Manley is city service manager.

Vienna, W. Va., plans pipe lines for water supply. Fund of $200,000 is being secured through Federal aid for this and other waterworks construction.

Perry, Mo., asks bids until Aug. 22 for pipe lines for water supply. Also for elevated steel tank and tower, pumping machinery and other waterworks equipment. Cost about $59,000. W. B. Rollins & Co., Railway Exchange Building, Kansas City, Mo., are consulting engineers.

Public Awards Hold Spotlight on Coast

SAN FRANCISCO, Aug. 12.—Two awards made during the past week for construction at Bonneville dam involved major steel tonnages. Columbia Steel Co. took the contract for gantry cranes and gates at the spillway dam, for which 6000 tons of structural steel will be required. Worden-Allen Co. will furnish 637 tons of structural steel. The contract for the lock-operating equipment, involving 1480 tons of shapes and 370 tons of miscellaneous steel, went to Pacific Coast Steel Corpn. It is reported that the structural steel required for the San Francisco mint, totaling 1000 tons, will be furnished by the Pacific Coast Steel Corpn. Reinforcing bar lettings during the past week have been almost nil.

Among the limited number of new contracts advertised, those for the furnishing of material at Rye Patch and Pine View dams, in Nevada and Utah, were outstanding. The Bureau of Reclamation will take bids the latter part of the month at Denver, Colo., for radial and high-pressure gates, hoists, hangers, conduit lining sections and other material under three specifications. The bureau has opened bids on two 168-in. diameter butterfly valves and bulkheads, weighing approximately 435 tons.

The recent increase in number of projects requiring only minor tonnages, but which form a large aggregate, has lent considerable encouragement to the trade, which now seems most hopeful. Activity in southern California continues at a good pace, while a number of contracts pending in northern California should be placed shortly. No change in prices has been reported.

Railroad Equipment

The Newfoundland Railway has ordered 20 box cars from the Koppel Industrial Car & Equipment Co.

Missouri Pacific Railroad has been authorized by the Federal Court to install air conditioning and cooling equipment in eight additional passenger coaches. Heretofore the court had granted authority to air-condition 168 passenger coaches and one business car.

Wheeling & Lake Erie is inquiring for 584 tons of tie plates and 123 tons of track spikes for relocation of tracks at Dover, Ohio.

PERSONALS

Awarded A. F. A. Gold Medal

MAJOR LAWRENCE LEE ANTHES has been awarded the John A. Penton gold medal by the American Foundrymen's Association in recognition of distinguished service to the foundry industry of America. The presentation of the medal will be made to Major Anthes at the time of the association's annual dinner to be held at the Royal York Hotel, Toronto, Canada, during the week of the 39th annual convention. Major Anthes has long been actively connected with the work of the association, having served as vice-president in 1906-1907 and as president in 1908-1909. In addition, he has served on many committees and for several years on the board of directors.

Major Anthes was born in Toronto, Canada, Nov. 26, 1876, and entered the service of the Toronto Foundry Co., in 1896, joining his father in the manufacture of cast iron soil pipe and fittings. In 1899 he left the foundry business temporarily to enter the field of journalism, but rejoined the Toronto Foundry Co., Ltd., in 1902 in the capacity of superintendent. The firm name was changed to Anthes Foundry, Ltd., in 1908.

Through the efforts of Major Anthes, the company extended its business and erected a soil pipe plant in Winnipeg in 1912. He became managing director and secretary-treasurer of the Anthes Foundry, Ltd., at Toronto and Winnipeg, August, 1914, upon the death of his father.

During the World War he was connected with the Canadian Expeditionary Forces from 1916 to 1918, with the rank of major. He was appointed director of the demobilization branch of the Department of Soldiers' Civil Re-Establishment in November, 1918, assuming responsibility of repatriation of Canadian overseas forces. He continued in this capacity until June, 1920.

Since his war activities, Major Anthes has devoted his time to various industrial and civic organizations. In addition to his position as president of the Anthes Foundry, Ltd., Toronto and Winnipeg, which he assumed in 1933, he is chairman of the board of Anthes-Tait Foundry, Ltd., Vancouver, B. C., president of Imperial Iron Corpn., Ltd., St. Catharines, and president, Lennox Furnace Co., Canada.

MAJOR L. L. ANTHES

Major Anthes served as chairman of the industrial relations committee, Canadian Manufacturers' Association, 1932-1933, and as vice-president (1932-33), and as president in 1933-34. At present he is first vice-president, National Construction Council of Canada, and is on the advisory board of the Canadian Construction Association. During the past year he has served as vice-president and chairman of the constitutional committee of the Canadian Institute of Plumbing and Heating.

WILLIAM J. HAMMOND, whose appointment as vice-president in charge of railroad sales for the Inland Steel Co. was announced in these columns last week.

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HARRY E. BERGER, since 1918 assistant purchasing agent of the York Ice Machinery Corpn., York, Pa., has been made general purchasing agent, succeeding the late Earle Gardner. Mr. Berger started with the York company in 1903 as a stenographer and from 1906 to 1918 served in the sales department.

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REBECCA HALL, foundry metallurgist, has opened an office at 180 North Michigan Avenue, Chicago, to handle all types of technical publicity. Miss Hall previously was associated with William H. Baldwin, public relations counsel for the International Nickel Co. and prior to that she was metallurgist for Lakeside Malleable Castings Co., Racine, Wis.

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WILLIAM REESE has been appointed manager of the tubular goods department, Pacific Coast Steel Corpn., with headquarters in San Francisco. For the past 12 years Mr. Reese has been in the New Orleans office of the National Tube Co.

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HERBERT P. LADDS, vice-president and general manager of the Lamson & Sessions Bolt Co., Birmingham, has been appointed organization chairman for Birmingham's thirteenth annual Community Chest appeal.

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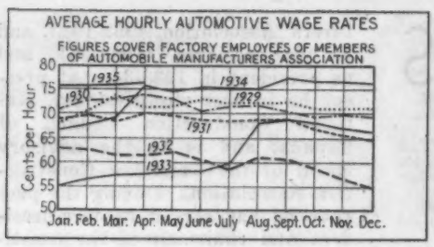
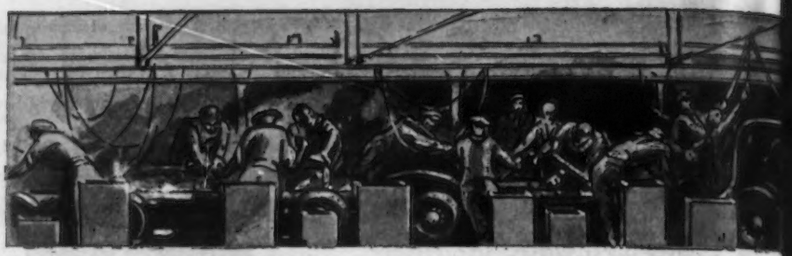
H. R. SLATER, formerly general manager of sales of the Cohoes Rolling Mill Co., Cohoes, N. Y., has been appointed general manager, succeeding A. MACFADYEN, who has become general manager of Page-Hersey Tubes, Ltd., Toronto, Ont.





THIS WEEK ON THE

Car Manufacturers Preparing for Active Final Quarter

DETROIT, Aug. 13.

VACATION season is traditionally the time of year when the motor car industry's enthusiasm is at low ebb. Peak sales and production have passed and ahead is a dull period during which as much effort sometimes is devoted to recharging the batteries of sales staffs as to selling cars to the public. It is an event, therefore, of the first water to see the hopes and enthusiasm of car manufacturers perking up in mid-August and executives bubbling over with exuberance usually reserved for the spring selling season.

There appears to be a sound basis for this optimism. Revised estimates of July passenger car sales in the United States place the total at 300,000 units because of the improvement in rural districts. A high automotive sales executive who has made a special study of farm income predicts that this year farmers will receive at least $2,000,000,000 more for their products than in 1934. A healthy percentage of this sum will go into car purchases during the remainder of this year.

Around 20 per cent of all automobiles (26.6 per cent of all trucks) are owned by farmers, yet it is estimated that during the depression new car purchases in agricultural areas shriveled to only 5 per cent of the total. Resumption of buying by this class, therefore, has had a profound influence on the motor car industry's fortunes.

Car assemblies in the United States and Canada during the first seven months of 1935 were about 2,720,000 units. From Aug. 1 to Dec. 31 of last year the industry built 797,569 units.

Fall introductions of new models will give an impetus to car sales in the final quarter which they did not have last year. It is not too much to expect, therefore, that output for the full 12 months of this year will be 3,750,000 units, which is 400,000 more cars than the industry anticipated building at the beginning of 1935.

Chevrolet Has Big Program

Car manufacturers are giving more than lip service to their hopes. Chevrolet is reported planning to make 255,000 of its 1936 models during the final quarter. Of that number about 55,000 will be built in October, 100,000 in November and 100,000 in December. Initial steel releases for parts for this production program have been given, but the bulk of the tonnage won't be purchased for a short time. Retail demand for Chevrolet cars has been so good that it is understood that some orders for 1935 cars will have to be filled with 1936 models.

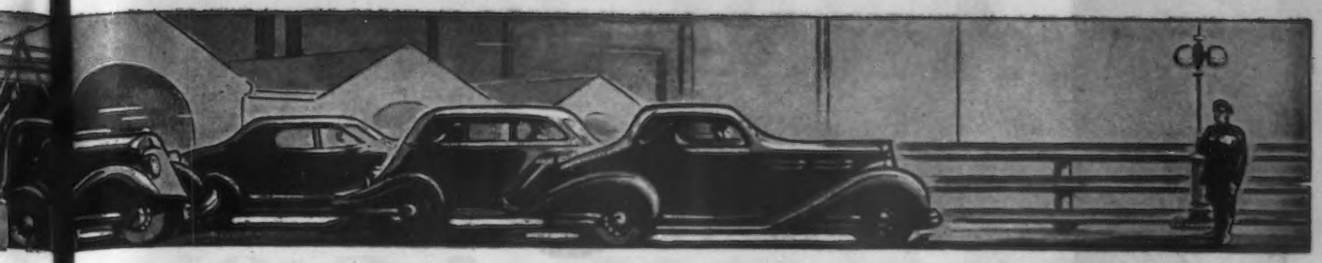
Ford is in the process of buying steel for 200,000 cars, which is only a part of the number it intends to build the remainder of this year. Chrysler will have a substantal production schedule in the last quarter. Steel mills are about ready to start deliveries to Briggs Mfg. Co. of the first tonnages for 1936 Plymouth bodies. The Briggs Highland Park plant, incidentally, has been down the past two weeks. Hudson has placed orders for flat-rolled steel for its coming models.

In high spirits over their success this year, automotive executives are talking in terms of a four-million-car year in 1936. They wouldn't be surprised if the final figure was higher than that amount. They point out that such a performance would be only moderately better than the production record this year. The prospect of a presidential campaign does not discourage them, even though it is popularly supposed to have an unsettling effect on business.

One official observes that two factors in particular will make for a still brisker automobile business in 1936. One is that 2,000,000 cars sold in 1934 merely replaced the same number which were scrapped that year; the figure will be larger this year and will expand again next year. The other is that sales to new owners are in substantial volume for the first time since 1930. They disappeared entirely in 1931 and 1932 and are estimated at around 60,000 during 1933. Last year they amounted to 443,000 units. They have shown a nice increase this year and should grow next year.

Fix 1936 Goals

General Motors tentatively is said to have fixed its 1936 goal at 1,600,000 to 1,700,000 units. Chrysler is understood to nourish the ambition to build 750,000 to 800,000 cars and trucks. Optimism is voiced by the Ford organization, although no bogey for the coming year is known to have been set up at Dearborn. However, it is reasonable to believe that Ford will surpass this year's showing in 1936; before the current year is out it will have made considerably



ASSEMBLY LINE

BY BURNHAM FINNEY
Detroit Editor, The Iron Age

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more than the million cars which Henry Ford said his company would manufacture during 1935.

Automotive parts and materials costs next year are expected to be approximately the same as at present. Asked about the possibility of lower steel prices, a high motor car executive replied to a group of Detroit newspapermen, "We think we should get a reduction, but don't expect to." Main hope of paring the cost of making automobiles in 1936 is in larger volume.

Retail factory prices are likely to remain close to current levels. As recovery progresses, car buyers are beginning to be interested again in style as well as price. This fact, in part, accounts for the sensational rise in volume this year of such cars as Pontiac, Dodge and Oldsmobile.

The only haze on an otherwise clear automotive horizon is the labor situation. Labor Day looms as a rallying date for two groups each of which is determined to save the automobile worker from the clutches of his greedy and inhuman employer. The group which is causing the biggest buzz of excitement is led by Father Coughlin, who will address a mass meeting the day prior to Labor Day at Belle Isle (the Detroit Federation of Labor beat Father Coughlin to the gun and engaged Belle Isle for Labor Day, the time which he originally set for his meeting).

Coughlin Irks A. F. of L.

Why Father Coughlin is interesting himself in organizing a new union of automobile workers is a mystery to Detroiters. The American Federation of Labor isn't very happy about his appearance on the labor scene and openly accuses him of being a tool of the manufacturers to discredit its activities here.

Several independent unions, including members of the official plant bargaining agencies throughout the industry, are trying to form a new organization made up of all automobile labor groups. The A. F. of L. has rejected an invitation to participate, general organizer Francis Dillon declaring that the federation "will not permit itself to be diverted from its historic mission." The Mechanics Educational Society, thought to have lost most of its strength in the past year, likewise has refused to submerge its identity in a new association.

The A. F. of L. has called its first constitutional convention of the United Automobile Workers to meet at the Fort Shelby Hotel, Detroit, from Aug. 26 to 31. At this gathering the new International Union of Automobile Workers will be formed, a constitution adopted and officers elected. It will be the first interational union organized since the federation organized the setting up of so-called vertical unions at its San Francisco convention. Local federal unions will form the basis of the international union and will be merged into it.

Despite the ballyhoo of the professional unions, the industry views the labor outlook for the coming winter with equanimity. Its feeling of greater confidence than in months is partly engendered by the fact that thousands of automobile workers this year will receive 10 or 11 months' pay at high hourly rates. With such steady incomes, men are less influenced by the union's tom-toms.

Despite removal of NRA's restrictions, leading car manufacturers intend to hold to the rule that even at peak times they will not work men longer than 48 hr. a week. At the same time they intend to give employees a chance to work somewhat longer hours than they have recently, thereby augmenting their incomes. The aim of fall introductions, of course, is to give factories a longer period in which to stock dealers and anticipate the spring buying rush and give regular workers steadier employment.

Running true to predictions August is bringing a shutdown of several automotive plants, including Pontiac and Oldsmobile, as changeovers are made for production of 1936 models.

Ford's Rouge plant, its 16 branch assembly plants and other manufacturing operations resumed work Monday on the 1935 production program after a mass vacation shutdown lasting two weeks. The shutdown at Rouge was not wholly effective, the necessity for filling emergency orders causing the final assembly line for Michigan and northern Ohio to run most of the first week of the vacation. Steel mills, blast furnaces, coke ovens, by-products plant and glass factory were not affected by the vacation closing. The Hamilton, Ohio, wheel plant also remained open. Ford's August sales volume will equal or exceed previous estimates. Retail deliveries of Ford commercial cars and trucks in the final 10 days of July were the largest for any 10-day period since the last 10 days in May of 1929. Significant of the sales pressure on the automobile industry is the fact that Fisher Body plants in many cases are going over without pausing from 1935 parts to fabrication of 1936 materials. Chrysler is expected to clean up current assemblies this month and some time in September will start work on its new lines. Packard already having made more than 25,000 of its 120 models is maintaining production at full speed and by the end of the year probably will have turned out 50,000 of these jobs, a remarkable achievement for any company making a new car in the $1,000 class. Buick apparently with an eye on

(CONTINUED ON PAGE 58)

ANNOUNCING

SEE IT IN CLEVELAND DOING HIGH SPEED PRECISION BORING AND JIG ELIMINATING

To the basic principles which have characterized P&W Jig Borers since they were introduced in 1917 have been added many new features which have speeded up production. These include higher spindle speeds, a wider feed range, and many built-in conveniences which make machine operation easier and quicker.

The new No. 2A Jig Borer is the finest example of the machine tool builder's art that has yet been turned out. Being designed to do precision work, it must be, and is, precision built from one end to the other.

The name "Jig Borer" is not a complete description of the work this machine will do. Of course it is used widely for boring jigs and fixtures. It is also used equally much as a "Jig Eliminator", and can do many small lot precision manufacturing jobs. Due to its open-side design, work can be set up easily on the P&W Jig Borer, and its built-in measuring instruments make layout a simple and accurate operation. There have been many cases where manufacturing was done completely on the Jig Borer at large savings, and without special tooling.

Pratt & Whitney engineers will be glad to go over your work and show you what the New No. 2A Jig Borer could do in your shop, both on "jig boring" and "jig eliminating". In the meantime write for your copy of this new book—just off the press.

PRATT & WHITNEY CO.

Hartford, Conn., U. S. A.

Branch Offices and Agencies: — BIRMINGHAM BOSTON CHICAGO CINCINNATI CLEVELAND DETROIT LOS ANGELES NEW YORK PHILADELPHIA PITTSBURGH ROCHESTER SAN FRANCISCO ST. LOUIS

The new 1935 Pratt & Whitney

No. 2A JIG BORER

NEW FEATURES

Twelve spindle speeds, 37 to 1800 R.P.M.

Eight spindle feeds in either direction, .0005" to .010" for each spindle speed.

Motor drives spindle through hardened and ground helical gears.

"Shockless" insulated motor and spindle drive.

Hardened, ground and lapped spindle quill.

Spindle mounted in permanently sealed ball bearings.

Direct reading ten-thousandth dial indicator built into each table slide.

Depth dial indicator.

Built-in electric lights.

The easiest and most convenient controls ever designed for a jig borer.

All tool changes made at the spindle nose.

Three point adjustable bearing on the floor.

The P&W Jig Borer locates to "tenths", bores where it locates, and then checks its own work.

KEEP *Noisy* GEARS OUT OF FINAL ASSEMBLY

Why waste the time and labor needed to assemble gears when in final assembly they prove too noisy to be passed? Then, the whole assembly must be torn down at an additional cost and rebuilt after gears have been corrected.

You avoid all this unnecessary expense and delay by a gear noise sound test. The RED RING GEAR SPEEDER tells you instantly just how noisy or how quiet any gear will be in operation. A special noise indicator can also be furnished.

No special sound testing room is needed. The RED RING GEAR SPEEDER may be located anywhere in the shop. It amplifies gear noises fifty times and excludes all other noises.

Write for special bulletin.

● *Red Ring GSB Gear Speeder as it appears in the production gear shop.*

● *Head of the GSH Speeder showing gears mounted in sound box for testing—also special noise indicator on bracket to the right.*

NATIONAL BROACH AND MACHINE CO.,
SHOEMAKER AND ST. JEAN DETROIT, MICHIGAN

(CONTINUED FROM PAGE 55)

a date in late September to announce its 1936 series is broadening its manufacture daily and may build 8000 cars this month and as many next month. Production of many companies is so irregular that it is almost impossible to estimate the industry's total for August although 200,000 units seems a safe bet. Chevrolet building 5600 cars a day will account for over 100,000 cars and trucks this month.

The extent to which the automobile industry is contributing to recovery in the capital goods industries is shown by the statement of President Sloan that General Motors this year is spending fifty million dollars for plant expansion and reconstruction in this country and in England and Germany. Mr. Sloan neglected to mention that much of this money is being spent not only to increase output but to provide more than one source of supply for parts within the corporation in case of a labor tie-up. Buick is completing a modernization program at Flint which has resulted in an outlay of $14,500,000 in the last 18 months. The transmission plant has been revamped at a cost of $2,500,000 and $700,000 has gone for improved equipment in the forge department. More than $1,080,000 has been expended in recent weeks for new tools and rearrangement of operations. In the foundry $750,000 went for new conveyors and machinery. Besides extensive retooling in the sheet metal plant a new type of Bonderizing equipment has been installed. A total of 1290 separate tool items ranging from all types of cutting tools to costly dies have been bought. This far-reaching program has been necessitated in part by increased parts production by Buick for Oldsmobile, Cadillac-LaSalle and Pontiac as well as for its own cars.

Operations Maintained At Buffalo

BUFFALO, Aug. 13.—Open-hearth operations in the Buffalo district are practically the same as last week, with the Lackawanna plant of the Bethlehem Steel Co. operating nine open-hearths; Republic Steel Corpn., varying between three and four, and the Wickwire-Spencer Steel Corpn. operating one. The Seneca sheet division of Bethlehem is running at 50 per cent of capacity.

While steel orders slipped off somewhat during the past week, it is believed that current operations will be maintained through the entire week.

Work to be done by the War Department in Tonawanda, N. Y., harbor and Black Rock ship canal in Buffalo will require 150 tons of reinforcing bars and about 100 tons of structural steel. Bids were taken last week. Some steel piling will also go into this job. St. Joseph's Academy, Dunkirk, N. Y., will construct a new building to require 100 tons of structural steel. The award has not yet been made for the steel. Meister Contracting Co. of Dunkirk is low general bidder.

The scrap market continues firm with little activity. No dealer is anxious to sell at present prices, believing that he would have difficulty filling the order. Current reports that one of the larger dealers sold a tonnage of No. 2 steel at $9.75, supplementing a sale of a month ago, are characterized as without foundation. One of the larger mills is known to have paid almost $9.50 for a tonnage of unprepared No. 2 heavy melting steel.

Steel Corporation's July Shipments At Lowest Rate Since January

SHIPMENTS of finished steel products by the United States Steel Corpn. in July totaled 547,794 tons, as compared with 578,108 tons in June.

The July total engaged 34.02 per cent for the 26 working days, compared with 36.7 per cent in June with only 25 working days.

In the first seven months of this year the Steel Corpn.'s shipments were 4,101,793 tons, compared with 4,048,833 tons in the corresponding period of 1934 and with 2,913,741 tons in the first seven months of 1933.

MONTHLY SHIPMENTS OF STEEL PRODUCTS BY UNITED STATES STEEL CORPN.

				1933		1934		1935	
Month	1930	1931	1932	Shipments	Per Cent of Capacity	Shipments	Per Cent of Capacity	Shipments	Per Cent of Capacity
January	1,104,168	800,031	426,271	285,137	17.7	331,777	19.8	534,055	31.9
February	1,141,912	762,522	413,001	275,929	18.5	385,500	26.3	583,137	39.2
March	1,240,171	907,251	388,579	256,793	15.3	588,209	36.6	668,056	41.5
April	1,188,456	878,558	395,091	335,321	21.6	643,909	41.5	591.728	36.7
May	1,203,916	764,178	338,202	455,302	27.1	745,063	44.4	598,915	35.8
June	984,739	653,104	324,746	603,937	37.4	985,337	61.2	578,108	36.7
July	946,745	593,900	272,448	701,322	45.1	369,938	23.0	547,794	34.0
August	947,402	573,372	291,688	668,155	39.8	378,023	23.1	.....	...
September	867,282	486,928	316,019	575,161	35.6	370,306	23.0	.....	...
October	784,648	476,032	310,007	572,897	35.5	343,962	20.6	.....	...
November	676,016	435,697	275,594	430,358	26.7	366,119	22.9	.....	...
December	579,098	351,211	227,576	600,639	38.7	418,630	26.1	.....	...
Plus or minus yearly adjustment	(40,259)	(6,040)	(5,160)	(44,283)	...	(19,907)	...	.....	...
Total for year	11,624,294	7,676,744	3,974,062	5,805,235	30.1	5,905,966	30.6	.....	...

WPA Allotment for New York City

APPROVAL has been given by the President to a WPA allotment of $18,373,236 for carrying out the works program of New York City. While no contributions have as yet been formally pledged by the sponsors of the program for which these funds have been allotted, definite assurance, it was announced, has been given that the Federal funds will be supplemented by a large additional contribution.

Republic to Go Ahead With Merger Plan

REPUBLIC STEEL CORPN. and Corrigan, McKinney Steel Co. will proceed forthwith with the consummation of the merger of the two companies, it was announced in a letter to Republic stockholders signed by T. M. Girdler, chairman of Republic Steel Corpn. The stockholders' meeting set for Aug. 15, the letter announced, will be postponed pending completion of final details leading to the merger. Officers of the company said it was expected that an amended registration statement will be filed with the Securities Exchange Commission early next week, and that the stockholders' meeting will be held about the middle of September.

This action follows the recent announcement by the United States Department of Justice that it would not appeal the decision of the district court which refused to enjoin the merger.

ICC to Administer Motor Carrier Act

PREPARATORY to administering the motor carrier act signed last Friday by President Roosevelt, the Interstate Commerce Commission has named Joseph B. Eastman, Federal Coordinator of Transportation, as head of a division of its recently created Bureau of Motor Carriers. The division will be made up of three members. The act provides the first regulation of motor vehicles and applies to all common and contract carriers engaged in interstate commerce of passengers or property, but, as pointed out by Mr. Eastman, exempts vehicles used exclusively in carrying livestock, fish or agricultural commodities or in the distribution of newspapers. There is a specific exemption of vehicles controlled and operated by farm cooperative associations. Persons who engage only casually or occasionally in transporting passengers or property for compensation and carriers which operate only within the metropolitan areas are conditionally exempted. Regulation is also provided for brokers, or those who arrange for transportation but do not themselves provide motor transportation.

The act is expected to put railroads on a better competitive basis with motor carriers because of the requirement that the latter establish just and reasonable rates and shall not discriminate in their rates or service. Their rates may be regulated as to both maxima and minima.

Chemical Exposition To Be Held in December

RECOGNITION of the value of display by American business is indicated by the enthusiastic planning now under way for the 15th Exposition of Chemical Industries. The industrial promotion value of expositions as a supplement to trade journal and newspaper advertising is becoming more and more appreciated both by exhibitors and their public. One evidence of this is the number of companies responding to the opportunity to exhibit their products and equipment at the 15th Exposition of Chemical Industries to be held in New York, at the Grand Central Palace, Dec. 2-7, 1935.

A high standard of display was attained at the last Chemical Exposition held in 1933. Results to which this excellence contributed were a large increase in attendance and remarkable sales results to the exhibitors.

Grand Central Palace as the setting for the 15th Exposition of Chemical Industries is an excellent one because of its central location at a focal point of travel and industry and business.

The conduct of the Exposition and all details of exhibit arrangement and leasing are in charge of the International Exposition Company, Grand Central Palace, New York, and will as heretofore be under the personal direction of Mr. Charles F. Roth, manager.

ASHTON VALVE CO., Boston, has appointed The Ashmead Danks Co., Rockefeller Bldg., Cleveland, distributers in the Northern Ohio area for its line of safety and relief valves, pressure gages, etc.

▲▲▲ Capital Goods

REGISTERING a 5 per cent decline from the previous week's figure, THE IRON AGE capital goods index last week dropped to 54.7. The loss was due almost wholly to drastically reduced operations in the automobile field, where output last week was barely in excess of 48,000 cars. This brought the adjusted index of automobile production to the year's low point of 40.9. The drop was 36 per cent greater than the normal seasonal recession at this stage called for, but, since the depression, seasonal variations have tended to shift about, and possibly too much significance should not be attached to current deviations therefrom. It must be remembered that the pronounced volume of business enjoyed by the automobile industry during the first half of the year was in excess of seasonal expectations for that period.

Elsewhere business in the durable goods industries last week continued active. Steel ingot output again advanced, lumber shipments were up slightly, and construction contract awards rose considerably.

At its present level THE IRON AGE index is about 24 per cent under the peak for the year thus far, which was established in the second week of February. Compared with corresponding periods in earlier years, last week's figure was 7 per cent above 1934, 12 per cent beneath 1933, and 16 per cent above 1932.

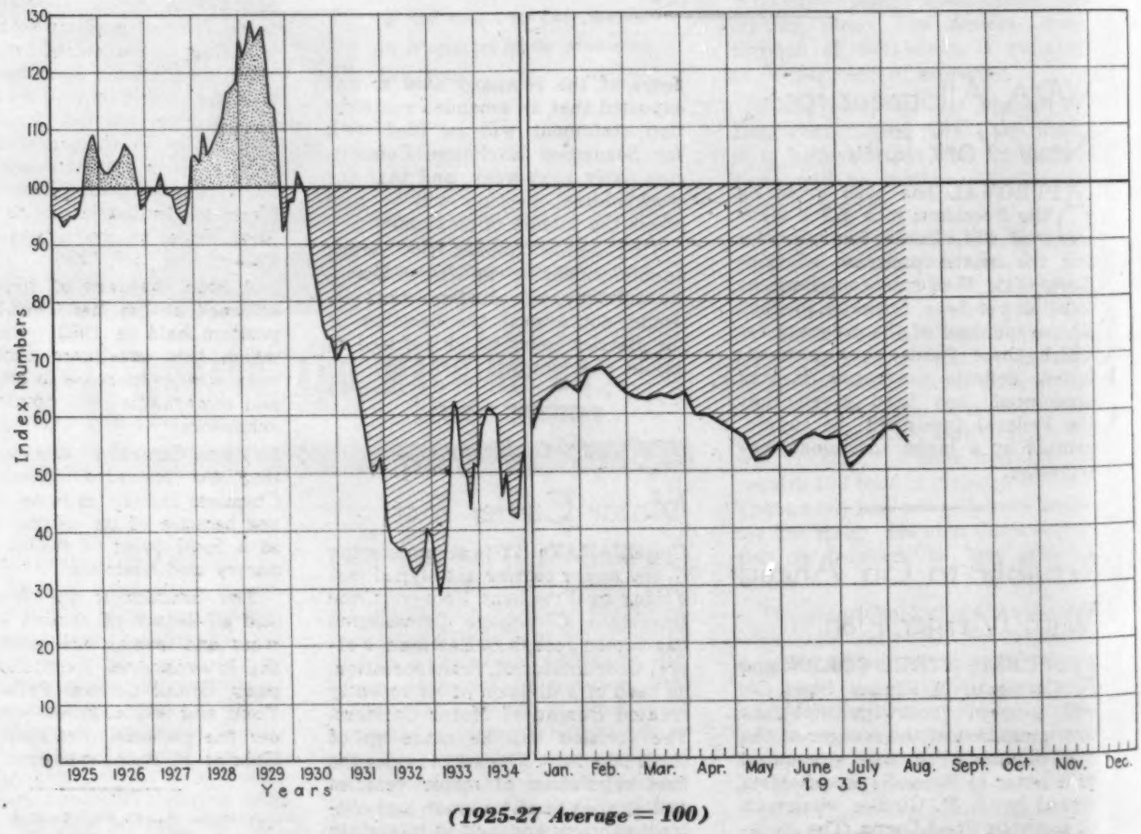
The Iron Age Weekly Index Numbers of Capital Goods Activity

(1925-27 = 100)

Last week (est.)	54.7
Preceding week (rev.)	57.6
Same week last month	52.9
Same week 1934	50.9
Same week 1933	61.1
Same week 1932	33.8
Same week 1931	58.9
Same week 1930	89.0
Same week 1929	124.7

Slow Recovery in Heavy Electrical Equipment

The production of heavy machinery and equipment used by the capital goods industries themselves has naturally been most severely affected by the depression and most laggard in recovery. The industries manufacturing this type of capital goods, like the machine tool industry, are extremely sensitive to variations in the business cycle, since they are twice removed from the stable market which supplies the ultimate consumer with the necessities of life.



The Iron Age Index of Capital Goods Activity. The years 1925 to 1934 are plotted by months, the current year by weeks.

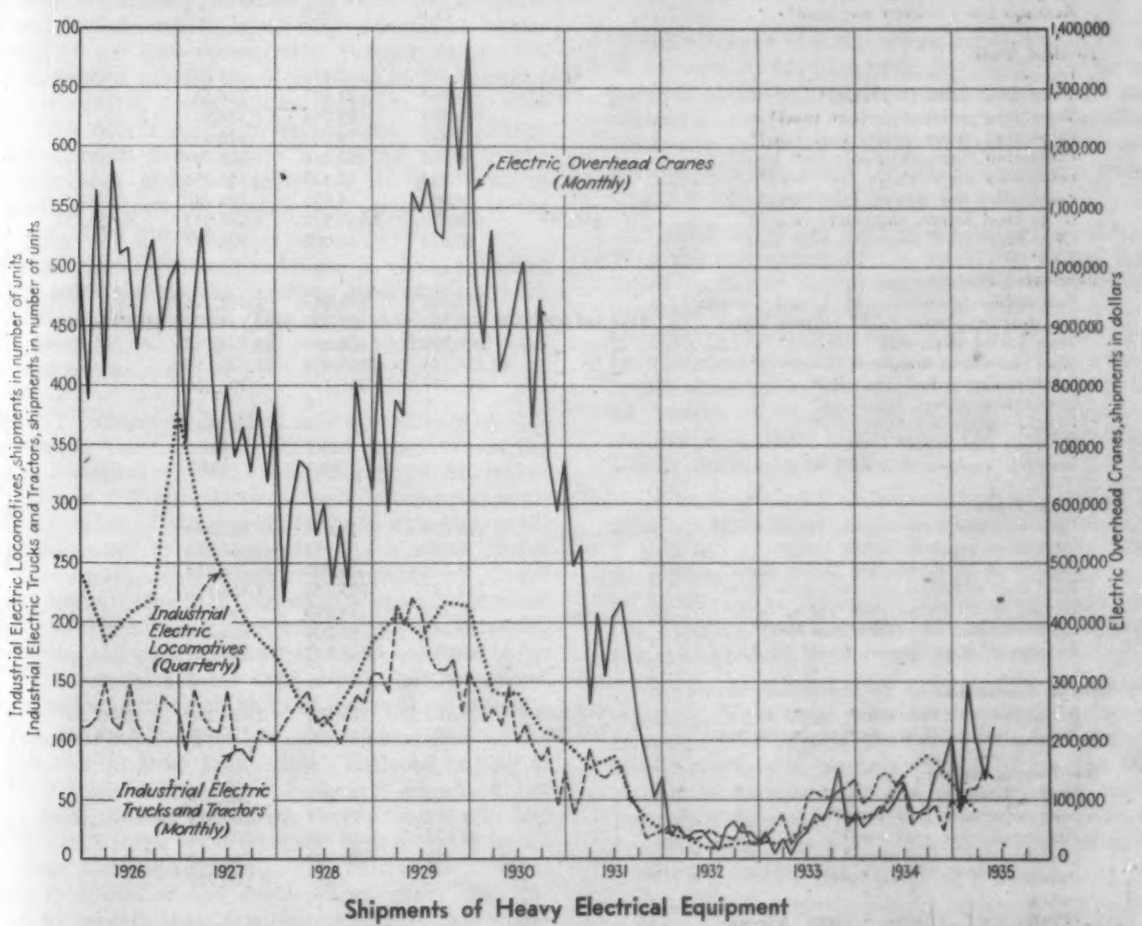
Index Declines ▲▲▲

The extraordinary instability of these industries is well illustrated by the trend in shipments of important types of heavy electrical equipment during the past decade. The chart at the bottom of the page shows on a monthly basis the dollar value of electric overhead cranes, and the number of industrial electric trucks and tractors shipped to customers, and, on a quarterly basis, the shipments of industrial electric locomotives.

Shipments of electric overhead cranes averaged $790,000 monthly during the four years prior to 1929 and rose to a peak of $1,380,000 in December of that year. The precipitate decline during the depression brought the monthly volume down to an average of only $42,000 in 1932 and to close to zero in April, 1933. Shipments increased sharply in the latter part of 1933 and have recently reached a volume larger than in any month since August, 1931. The volume has since declined sharply but remains well above depression lows.

Shipments of industrial electric locomotives and of trucks and tractors rose to relatively high levels during 1929 but were affected to a much less extent by boom prosperity than were electric overhead cranes. Shipments of locomotives reached a much higher level in 1926 and 1927 than in 1929. The volume of business in these products fell off steadily during the early part of the depression and, during 1932, reached a level only 10 per cent of that of the 1929 peak. An erratic but substantial recovery in shipments of trucks and tractors and locomotives has since occurred, and in recent months the volume of business in these products has regained an appreciable part of the maximum loss recorded during the depression.

Industries manufacturing heavy types of capital equipment obviously have a long road to travel before returning to a profitable basis of operation. That even a modest recovery has occurred, however, is distinctly encouraging in view of the fact that the capital goods industries, which are the buyers of this class of machinery, are still severely depressed.



Shipments of Heavy Electrical Equipment

Sources: ***Shipments of electric overhead cranes: Electric Overhead Crane Institute; industrial electric trucks and tractors: United States Department of Commerce, Bureau of the Census; industrial electric locomotives: United States Department of Commerce, Bureau of the Census. All series were obtained from the*** Survey of Current Business, ***United States Department of Commerce.***

Current Metal Working Activity Statistically Shown

These Data Are Assembled By THE IRON AGE from Recognized Sources And Are Changed Regularly As More Recent Figures Are Made Available

	July, 1935	June, 1935	July, 1934	Seven Months, 1934	Seven Months, 1935
Raw Materials:					
Lake ore consumption (gross tons)[a]	.....	2,198,757	1,599,865	15,322,984	.....
Coke production (net tons)[b]	.....	.....	2,432,000	20,021,203	.....
Pig Iron:					
Pig iron output—monthly (gross tons)[c]	1,520,263	1,552,514	1,224,826	11,023,139	11,319,263
Pig iron output—daily (gross tons)[c]	49,041	51,750	39,510	51,996	53,393
Castings:					
Malleable castings—production (net tons)[d]	.....	27,548	23,388	237,429	.....
Malleable castings—orders (net tons)[d]	.....	25,668	21,862	229,509	.....
Steel castings—production (net tons)[d]	.....	27,665	46,182	295,666	.....
Steel castings—orders (net tons)[d]	.....	30,257	41,822	315,372	.....
Steel Ingots:					
Steel ingot production—monthly (gross tons)[e]	2,270,224	2,230,893	1,489,453	17,892,007	18,294,915
Steel ingot production—daily (gross tons)[e]	87,316	89,236	59,578	98,851	101,077
Steel ingot production—per cent of capacity[e]	39.44	40.31	27.06	44.79	45.70
Employment in Steel Industry:					
Total employees[e]	.....	416,732	424,126	425,161	.....
Total payrolls (thousands of dollars)[e]	.....	$41,903	$34,913	$293,314	.....
Average hours worked per week[e]	.....	31.4	25.8	32.9	.....
Finished Steel:					
Trackwork shipments (net tons)[e]	4,054	4,210	5,226	33,873	25,629
Sheet steel sales (net tons)[f]	.....	128,957	72,517	1,258,161	.....
Sheet steel production (net tons)[f]	.....	143,309	85,286	1,334,517	.....
Fabricated shape orders (net tons)[g]	.....	117,477	75,257	670,445	.....
Fabricated shape shipments (net tons)[g]	.....	85,568	103,010	565,081	.....
Fabricated plate orders (net tons)[d]	.....	17,914	12,523	151,356	.....
Reinforcing bar awards (net tons)[e]	.....	14,985	14,595	125,480	.....
U. S. Steel Corpn. shipments (tons)[h]	547,794	578,108	369,938	4,048,833	4,101,793
Ohio River steel shipments (net tons)[i]	.....	80,620	60,005	396,437	.....
Fabricated Products:					
Automobile production, U. S. and Canada[k]	.....	377,065	276,047	2,072,394	.....
Construction contracts, 37 Eastern States[l]	$159,249,900	$148,005,200	$119,662,300	$973,764,200	$855,756,700
Steel barrel shipments (number)[d]	.....	501,730	608,644	4,434,758	.....
Steel furniture shipments (dollars)[d]	.....	$1,137,173	$863,439	$6,700,150	.....
Steel boiler orders (sq. ft.)[d]	.....	391,497	385,218	2,301,268	.....
Locomotive orders (number)[m]	.....	3	0	83	.....
Freight car orders (number)[m]	.....	5,151	0	23,383	.....
Machine tool index[n]	.....	91.1	34.7	†38.6	.....
Foundry equipment index[o]	.....	100.1	50.7	†62.5	.....
Foreign Trade:					
Total iron and steel imports (gross tons)[p]	.....	33,208	17,676	185,314	.....
Imports of pig iron (gross tons)[p]	.....	6,583	2,997	68,383	.....
Imports of all rolled steel (gross tons)[p]	.....	19,678	10,900	66,863	.....
Total iron and steel exports (gross tons)[p]	.....	289,687	233,186	1,486,356	.....
Exports of all rolled steel (gross tons)[p]	.....	65,319	74,525	569,288	.....
Exports of finished steel (gross tons)[p]	.....	60,643	64,205	429,310	.....
Exports of scrap (gross tons)[p]	.....	215,098	155,812	894,660	.....
British Production:					
British pig iron production (gross tons)[r]	547,300	529,300	528,300	3,426,700	3,719,300
British steel ingot production (gross tons)[r]	803,300	770,000	718,200	5,225,500	5,604,500
Non-Ferrous Metals:					
Lead production (net tons)[s]	.....	33,002	31,881	245,578	.....
Lead shipments (net tons)[s]	.....	26,978	29,479	207,923	.....
Zinc production (net tons)[t]	.....	34,677	24,756	208,764	.....
Zinc shipments (net tons)[t]	.....	29,393	26,966	216,862	.....
Deliveries of tin (gross tons)[v]	.....	4,615	3,575	26,020	.....

*Preliminary. †Three Months' Average.

Source of figures: [a] Lake Superior Iron Ore Association; [b] Bureau of Mines; [c] THE IRON AGE; [d] Bureau of the Census; [e] American Iron and Steel Institute; [f] National Association of Flat-Rolled Steel Manufacturers; [g] American Institute of Steel Construction; [h] United States Steel Corpn.; [i] United States Engineer, Pittsburgh; [k] When preliminary, from Automobile Manufacturers Association—Final figures from Bureau of the Census; [l] F. W. Dodge Corpn.; [m] *Railway Age;* [n] National Machine Tool Builders Association; [o] Foundry Equipment Manufacturers Association; [p] Department of Commerce; [r] British Iron and Steel Federation; [s] American Bureau of Metal Statistics; [t] American Zinc Institute, Inc.; [v] New York Commodities Exchange.

SUMMARY OF THIS WEEK'S BUSINESS

Output Reaches 49 Per Cent; Scrap Prices Still Rising

Steel Production Registers Sixth Consecutive Weekly Advance—Demand Expands Despite Curtailed Operations of Automobile Industry

RISING two points to 49 per cent of capacity in its sixth consecutive weekly advance, steel ingot production is now at the highest level since the third week in February. Though there are indications of a leveling off of output at Pittsburgh, where operations are unchanged at 43 per cent, and at Cleveland and Buffalo, where ingot rates remain at 50 per cent and 38 per cent respectively, further gains were made elsewhere, among them increases of three points to 57 per cent at Chicago, two points to 52 per cent in the Valleys, six points to 34 per cent in the Philadelphia district, three points to 78 per cent in the Wheeling area and five points to 38 per cent in the South. Detroit operations hold unchanged at the high rate of 95 per cent.

Scrap prices continue to advance in various market centers, and rises in heavy melting steel at Pittsburgh and Chicago have raised THE IRON AGE scrap composite from $11.83 to $12.08 a ton, its highest level since the second week in February.

RECENT expansion in steel mill operations has occurred in the face of diminished releases from the automobile industry. While a leading motor car maker has resumed full operations after a two weeks' shutdown, a number of other producers are now idle, pending changeovers to new models. As a result, automobile assemblies this month will probably not exceed 200,000 units. However, automotive steel is expected to move in expanding volume within the next fortnight. Meanwhile, tin plate output, which is believed to be due for a recession later this month, has registered an unexpected gain from 82 to 85 per cent of capacity.

Miscellaneous demand remains the mainstay of the current rise in steel production. Railroad buying is disappointingly light. The Seaboard Air Line has placed 6000 tons of rails with the Alabama mill and Chicago producers have received a number of small rail orders totaling 2000 tons. The railroad equipment market is devoid of new developments other than the revival of reports that large car purchases may materialize before the end of the year.

FABRICATED steel lettings of 15,920 tons compare with 21,450 tons a week ago. New projects call for 14,780 tons as against 10,300 tons last week and 22,600 tons two weeks ago. Sheet steel piling orders total 2900 tons.

Awards to date this year of constructional steel, including fabricated structural steel, plate work, reinforcing and sheet steel piling, total 669,804 tons as compared with 767,427 tons in the corresponding period in 1934.

THE strength of scrap prices, coupled with the steady increase in foundry melt, has given rise to talk of possible advances in pig iron prices. Along the Eastern seaboard, however, foreign competition is likely to block any move for higher domestic quotations. At various Atlantic ports imported brands are undercutting American iron by $2 to $3 a ton.

Cold-finished bar extras are being revised in line with the narrowing of the base size range for hot-rolled bars, and the present method of quoting wire products is being modified in the interests of greater simplicity. Though all details of the changes have not been worked out, the new plan of quoting wire products is reported to provide for a base carload price for all buyers, with various quantity differentials for smaller lots, thus eliminating the present 20c. per 100 lb. deduction to jobbers.

A leading steel maker has advanced forging billets $3 a ton to $35 base and has classified all sizes under 5 x 5 in. as bars. The change, which is effective Aug. 20 and which is expected to be adopted by other mills, was made because it was necessary, in view of the exacting requirements of customers, to supply a bar mill product in the smaller sizes.

Scattered instances of overgrading of sheets constitute a disturbing price development, but weakness in reinforcing bars is less marked than recently. The recent revision of bending extras, by cutting the distributer's margin, has had a stabilizing influence. Reduction of resale prices on pipe may likewise be resorted to as means of reducing irregularities in the secondary market for tubular goods.

Though most producers are understood to be preparing to announce fourth quarter prices about Aug. 21, they will probably not file them with the American Iron and Steel Institute, as was the practice under the code.

THE IRON AGE composite prices for pig iron and finished steel are unchanged at $17.84 a ton and 2.124c. a lb. respectively.

A Comparison of Prices

Market Prices at Date, and One Week, One Month, and One Year Previous; Advances Over Past Week in Heavy Type, Declines in Italics

Pig Iron

Per Gross Ton:	Aug. 13, 1935	Aug. 6, 1935	July 16, 1935	Aug. 14, 1934
No. 2 fdy., Philadelphia	$20.3132	$20.3132	$20.3132	$20.26
No. 2, Valley furnace	18.50	18.50	18.50	18.50
No. 2 Southern, Cin'ti	19.2007	19.2007	19.2007	19.13
No. 2, Birmingham†	14.50	14.50	14.50	14.50
No. 2 foundry, Chicago*	18.50	18.50	18.50	18.50
Basic, del'd eastern Pa.	19.8132	19.8132	19.8132	19.76
Basic, Valley furnace	18.00	18.00	18.00	18.00
Malleable, Chicago*	18.50	18.50	18.50	18.50
Malleable, Valley	18.50	18.50	18.50	18.50
L. S. charcoal, Chicago	24.2528	24.2528	24.2528	24.04
Ferromanganese, seab'd carlots	85.00	85.00	85.00	85.00

†This quotation is for delivery in South; in the North prices are 38c. a ton under delivered quotations from nearest Northern furnace.

*The switching charge for delivery to foundries in the Chicago district is 60c. per ton.

Rails, Billets, etc.

Per Gross Ton:				
Rails, heavy, at mill	$36.37½	$36.37½	$36.37½	$36.37½
Light rails, Pittsburgh	35.00	35.00	35.00	35.00
Rerolling billets, Pittsburgh	27.00	27.00	27.00	27.00
Sheet bars, Pittsburgh	28.00	28.00	28.00	28.00
Slabs, Pittsburgh	27.00	27.00	27.00	27.00
Forging billets, Pittsburgh	32.00	32.00	32.00	32.00
Wire rods, Pittsburgh	38.00	38.00	38.00	38.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb.	1.70	1.70	1.70	1.70

Finished Steel

Per Lb.:	Cents	Cents	Cents	Cents
Bars, Pittsburgh	1.80	1.80	1.80	1.80
Bars, Chicago	1.85	1.85	1.85	1.85
Bars, Cleveland	1.85	1.85	1.85	1.85
Bars, New York	2.15	2.15	2.15	2.13
Plates, Pittsburgh	1.80	1.80	1.80	1.80
Plates, Chicago	1.85	1.85	1.85	1.85
Plates, New York	2.09	2.09	2.09	2.08
Structural shapes, Pittsburgh	1.80	1.80	1.80	1.80
Structural shapes, Chicago	1.85	1.85	1.85	1.85
Structural shapes, New York	2.06¼	2.06¼	2.06¼	2.05¼
Cold-finished bars, Pittsburgh	1.95	1.95	1.95	2.10
Hot-rolled strips, Pittsburgh	1.85	1.85	1.85	1.85
Cold-rolled strips, Pittsburgh	2.60	2.60	2.60	2.60

Finished Steel

Per Lb.:	Aug. 13, 1935 Cents	Aug. 6, 1935 Cents	July 16, 1935 Cents	Aug. 14, 1934 Cents
Hot-rolled annealed sheets, No. 24, Pittsburgh	2.40	2.40	2.40	2.40
Hot-rolled annealed sheets, No. 24, Gary	2.50	2.50	2.50	2.50
Sheets, galv., No. 24, P'gh	3.10	3.10	3.10	3.10
Sheets, galv., No. 24, Gary	3.20	3.20	3.20	3.20
Hot-rolled sheets, No. 10, P'gh	1.85	1.85	1.85	1.85
Hot-rolled sheets, No. 10, Gary	1.95	1.95	1.95	1.95
Wire nails, Pittsburgh	2.60	2.60	2.60	2.60
Wire nails, Chicago dist. mill	2.65	2.65	2.65	2.65
Plain wire, Pittsburgh	2.30	2.30	2.30	2.30
Plain wire, Chicago dist. mill	2.35	2.35	2.35	2.35
Barbed wire, galv., Pittsburgh	3.00	3.00	3.00	3.00
Barbed wire, galv., Chicago dist. mill	3.05	3.05	3.05	3.05
Tin plate, 100 lb. box, P'gh	$5.25	$5.25	$5.25	$5.25

Scrap

Per Gross Ton:				
Heavy melting steel, P'gh.	$13.00	$12.75	$11.75	$11.25
Heavy melting steel, Phila.	11.00	11.00	10.50	10.00
Heavy melting steel, Ch'go.	12.25	11.75	10.25	9.25
Carwheels, Chicago	12.75	12.25	10.75	9.50
Carwheels, Philadelphia	11.25	11.25	11.25	11.25
No. 1 cast, Pittsburgh	13.50	13.50	13.25	12.25
No. 1 cast, Philadelphia	11.25	11.25	11.25	11.75
No. 1 cast, Ch'go (net ton)	11.00	10.50	9.25	8.00
No. 1 RR. wrot., Phila.	10.25	10.25	10.25	11.25
No. 1 RR. wrot., Ch'go (net)	9.50	9.50	8.25	7.25

Coke, Connellsville

Per Net Ton at Oven:				
Furnace coke, prompt	$3.25	$3.25	$3.25	$3.85
Foundry coke, prompt	4.00	4.00	4.00	4.60

Metals

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Electrolytic copper, refinery	7.75	7.75	7.75	8.75
Lake copper, New York	8.12½	8.12½	8.12½	9.12½
Tin (Straits), New York	49.62½	52.50	52.37½	52.90
Zinc, East St. Louis	4.50	4.50	4.30	4.30
Zinc, New York	4.87½	4.87½	4.67½	4.65
Lead, St. Louis	4.05	4.05	4.00	3.60
Lead, New York	4.20	4.20	4.15	3.75
Antimony (Asiatic), N. Y.	13.00	12.75	12.75	8.50

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables.

The Iron Age Composite Prices

	Finished Steel	Pig Iron	Steel Scrap
Aug. 13, 1935	2.124c. a Lb.	$17.84 a Gross Ton	$12.08 a Gross Ton
One week ago	2.124c.	17.84	11.83
One month ago	2.124c.	17.84	10.83
One year ago	2.124c.	17.90	10.17
	Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strips. These products make 85 per cent of the United States output.	Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.	Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

	Finished Steel High	Finished Steel Low	Pig Iron High	Pig Iron Low	Steel Scrap High	Steel Scrap Low
1935	2.124c., Jan. 3	2.124c., Jan. 8	$17.90, Jan. 8	$17.83, May 14	$12.33, Jan. 8	$10.33, April 23
1934	2.199c., April 24	2.008c., Jan. 2	17.90, May 1	16.90, Jan. 27	13.00, Mar. 13	9.50, Sept. 25
1933	2.015c., Oct. 3	1.867c., April 18	16.90, Dec. 5	13.56, Jan. 3	12.25, Aug. 8	6.75, Jan. 3
1932	1.977c., Oct. 4	1.926c., Feb 2	14.81, Jan. 5	13.56, Dec. 6	8.50, Jan. 12	6.43, July 5
1931	2.037c., Jan. 13	1.945c., Dec. 29	15.90, Jan. 6	14.79, Dec. 15	11.33, Jan. 6	8.50, Dec. 29
1930	2.273c., Jan. 7	2.018c., Dec. 9	18.21, Jan. 7	15.90, Dec. 16	15.00, Feb. 18	11.25, Dec. 9
1929	2.317c., April 2	2.273c., Oct. 29	18.71, May 14	18.21, Dec. 17	17.58, Jan. 29	14.08, Dec. 3
1928	2.286c., Dec. 11	2.217c., July 17	18.59, Nov. 27	17.04, July 24	16.50, Dec. 31	13.08, July 2
1927	2.402c., Jan. 4	2.212c., Nov. 1	19.71, Jan. 4	17.54, Nov. 1	15.25, Jan. 11	13.08, Nov. 22

Pittsburgh Production Holds at 43 Per Cent

Valley Rate Up Two Points to 52 Per Cent and Wheeling District Average Up Three Points to 78 Per Cent—Scrap Advances

PITTSBURGH, Aug. 13.—Raw steel production in the Pittsburgh district has leveled off and this week remains unchanged at 43 per cent of capacity. Minor gains are reported in the Valleys and nearby northern Ohio mills, where production has risen two points to 52 per cent, and in the Wheeling district, where output is three points higher at 78 per cent.

Although not a great deal of support is now coming from automobile demand and tin plate demand is believed to be due for a recession later this month, prospects for a continued steady pace of steel activity at Pittsburgh are considered extremely favorable. Automotive steel is expected to move in expanding volume late in August or early in September, and the unusual staying powers of miscellaneous steel consumption are further sustaining the present sentiment. A slightly better flow of structural steel and piling orders also is a supporting influence. Little steel rail business is in sight, and small operating gains at some Pittburgh units this week have been offset partly by the idleness of the local rail mill, which completed part of its run on two small orders last week. The announcement of the Republic Steel Corpn. of an advance of $3 a ton on forging quality billets, effective on Aug. 20, was the forerunner of a general mark-up on that item planned by all important producers. Other price changes are in the making, largely dealing with the stabilization of resale markets, and probably will be announced before or coincidental with naming of fourth quarter schedules on Aug. 21. Changes in extras on hot-rolled bars will soon be reflected in revisions on cold-finished bar cars.

Pig Iron

Recent improvement in small-lot demand is sustained. Practically all tonnage is for prompt shipment, however, and furnace backlogs remain extremely thin. Dependent upon the intake of orders, the Shenango furnace may be relighted by Sept. 1. Large buyers of basic or Bessemer show no disposition to cover ahead, while the heavy melt of pig iron at most mill equipment plants in this district is generally supplied on reciprocal arrangements. Although definite announcements are lacking, it is considered quite likely that producers here will reaffirm present quotations for fourth quarter delivery.

Semi-Finished Steel

Demand shows little change of pace, except possibly a slight acceleration in the case of detached sheet and strip mills. Sheet bars for tin plate conversion unquestionably will be moving in smaller volume within a fortnight in step with the declining activity among tin plate mills now in sight for the remainder of August. Forging shops are displaying wider interest in forging stock. Volume of skelp shipments is holding. The entry of a large wrought iron pipe maker into the manufacture of steel pipe will create a fairly substantial additional outlet for skelp.

Bolts, Nuts and Rivets

The trend in demand is slightly downward. The price situation leaves a good deal to be desired, and some makers are dubious that early stability can be accomplished. Softness centers in bolt and nut prices, while a strong tone characterizes the rivet market.

Cold-Finished Bars

The inflow of general orders is considered remarkably steady for the season. Automobile and parts makers have not yet ordered substantially for new model requirements, and the prospect of this business later in the month is kiting hopes of some producers of surpassing July bookings, which ran well ahead of those in July last year.

There probably will be some adjustments made soon in the cold-finished bar price set-up in line with the narrowing of the base size range in hot-rolled bars to become effective this week.

Reinforcing Bars

Although mills in this district report little change in incoming tonnage, a fairly substantial aggregate volume of business is in the offing. At present, interest is directed toward the Pacific Coast, where opening of bids is scheduled this week on a large tonnage for the Metropolitan Water District of Southern California, which on one project alone will take about 23,000 tons. The Socony Vacuum Oil Co., Inc., has let a general contract to Arthur G. McKee, Cleveland, for a plant on Neville Island, Pa., which will require a round lot of reinforcing bars. Spottiness in distributor's prices persists, but no open breaks have appeared. Mills are tackling the problem of stabilizing the market by revamping extras. In one instance, revision last week of bending extras has cut the distributors' margin about $1 a ton.

Tubular Products

A continued slight uptrend in demand is noticeable. A marked improvement is reported in demand for mechanical tubing, with somewhat lesser gains recorded in the movement of locomotive boiler tubes. Standard pipe bookings are showing up in fair relation to the remainder of the tube market, but line pipe remains a rather inactive item. The mainstay of the whole market continues to be the steady movement of oil country goods.

Bars

Without notable aid from automotive demand, volume of bookings is well sustained. Incoming tonnage is slated for measurable expansion later in August, when motor car and parts makers are expected to enter the market in a large way. Thus far, the new classification of extras, issued by the Carnegie Steel Co. and to be adopted generally by other producers here, has had little or no effect on orders, despite the narrowing of the base sizes on rounds and squares. The removal of the $5 a ton extra on forging quality bars is believed to be an excellent means of forestalling any irregularities in the application of extras.

Wire Products

The recent increases in incoming tonnage are being held, and the prospect of additional gains in automobile requirements later this month is considered to be quite favorable. At present, lists of orders are fairly representative of all consuming groups, with general manufacturing lines and merchant

trade in farm regions leading. Road mesh demand is more active. Bids will be opened this month in Pennsylvania for 125 miles of mesh, totaling about 700 to 800 tons.

Plates and Shapes

About 3700 tons of small shapes and plates is reported to have been placed with the leading mill in this district by the Marion Steam Shovel Co., Marion, Ohio, which has received order from the Raymond City Coal Co., Cincinnati, for 24 coal barges. The Dravo Contracting Co., Pittsburgh, will place about 3000 tons for two river towboats and 10 barges ordered by the Ohio River Co., Cincinnati. The only other important source of demand at present is for railroad car construction, most of the recent requirements of which have been placed.

The past week brought a small aggregate tonnage of structural steel business to local mills. About 2700 tons will be bought by the Dravo Contracting Co., Pittsburgh, for erecting lock and dam No. 1 at Red House, W. Va. The Independent Bridge Co. obtained order for 1250 tons for locks at Red Wing, Minn.

Although plain material prices remain firm, fabricated quotations are highly competitive and sharp concessions are the general rule.

Sheets

Miscellaneous orders in the past week were in larger volume, while automotive tonnage reflected a minor gain. The combined increase probably will be sufficient impetus to boost sheet operations for the industry another five points this week to 65 per cent of capacity. The ratio of miscellaneous tonnage, including orders from the farm equipment industry, to current automobile tonnage is nearly five to one, indicating an amazingly heavy flow of business from so-called unclassified sources. Talk of pressure for lower prices has subsided since the Ford purchase, and at the moment sheet quotations present a strong front. Some difficulty persists in jobbing markets on galvanized, but steps are being taken to rectify the present conditions.

Tin Plate

Although output in the current week is running three points higher at 85 per cent, owing to the resumption of operations at one mill, producers are becoming quite conservative in their estimates of forward production, and the consensus of opinion is that a decline within a week or two would not be surprising. Present output, with one or two exceptions, is not moving directly into consumption, and mill stocks of tin plate are by no means skimpy. Stocks of cans in packers' hands also are reported to be substantial.

Strip Steel

Miscellaneous orders are maintaining, and, in some instances, are bettering the volume of the past two weeks. Hot and cold-rolled strip production this week will be slightly higher at a full 35 per cent. Important improvement hinges almost entirely upon major buying by the automotive industry for new models some time this month or early in September. With strip prices having withstood the first heavy attack, when Ford recently placed about 10,000 to 12,000 tons, the present price situation is clear of any unsettlement.

Coal and Coke

This market continues to disregard the improvement in steel and other industrial activity in this district. This condition perhaps is a reflection of heavy stocks of fuel accumulated at the beginning of the series of strike threats. The lack of demand for bituminous coal is serving to steady, rather than to depress, prices, which usually are subject to severe cutting only when tempting tonnages are up for figuring. Domestic sized coal and coke are beginning to move more freely, but most of this business is being handled by truck and has not gained important proportions. Domestic coke is available at around $3.40, ovens. The prevailing minimum for spot furnace coke is $3.25; for foundry, $4, at Connellsville ovens. Premium brands of foundry coke are still commanding $5.10, ovens.

Scrap

With most consumers in the Pittsburgh and Wheeling districts on the sidelines, the scrap market has reverted to a dealer affair. The past week, barren of important consumer buying, revealed a wide variety of dealer bidding to cover recent orders. In no instances have dealers been able to obtain ordinary No. 1 heavy melting steel in measurable quantities at less than $12.75 and the current quotational range for that grade has moved 25c. a ton higher to $12.75 to $13.25. At least one broker is reported to be offering as high as $13.50 to cover for one destination, but that figure cannot be regarded as wholly significant of present market conditions. Markedly higher prices have been paid recently at Pittsburgh and nearby districts for high-grade railroad steel scrap, but it is impossible to uncover sales of ordinary steel at prices even approximating various reports in the local trade. Although a lull in buying in the Wheeling-Steubenville district has taken some of the recent flush off the market, all quotations present a strong undertone.

Weekly Indications of Steel Activity

From The Iron Age

	Aug. 13, 1935	Aug. 6, 1935	July 16, 1935	Aug. 14, 1934	Average Year to Date 1935	Average Year to Date 1934
Steel ingot operations—Per cent of capacity	49.0	47.0	40.5	22.0	45.3	43.6

	Week Ended Aug. 13, 1935	Aug. 6, 1935	July 16, 1935	Aug. 14, 1934	Year to Date 1935	Year to Date 1934
Fabricated structural steel awards	15,920	21,450	17,000	15,600	431,072	514,420
Fabricated plate awards	160	7,165	6,225	2,400	78,192	87,867
Sheet steel piling awards	2,900	2,300	0	0	33,865	37,660
Reinforcing bar awards	1,475	4,800	4,400	500	126,675	127,480

Chicago Rate Rises Three Points to 57 Per Cent

Steel Scrap Registers Another Advance—Higher Pig Iron Prices a Possibility—Cold-Finished Bar Extras Being Revised

CHICAGO, Aug. 13.—Ingot output continues to push upward and has registered a three-point gain to 57 per cent of capacity. Miscellaneous demand for finished steel is still on the upward trend, and mills are now getting the benefit of new automobile business as active work starts on new models. Antomobile parts makers are swinging into active production, and some automobile foundries have heavy bookings that are causing worry to operators when they look forward to the problems that are near at hand in the matter of meeting deliveries.

The local scrap market retains all the vim that it has shown during the past three weeks. Heavy melting steel prices have been pushed up another 50c., and other grades, particularly the foundry grades, are moving to higher price levels as buying expands.

The matter of pig iron prices will bear some watching, the market being very strong.

New extras on cold-finished bars are in the making.

In all other respects prices for finished steel remain steady, even to the point that reinforcing bar quotations by local dealers show more strength.

Western railroads are finally taking some figures on bridges that are to replace structures taken out by floods early in the summer. The railroad equipment market is dull, though steel men are again talking about rolling stock that will come before the trade late in the year.

Pig Iron

Shipments are running 20 per cent ahead of July and all signs point to further gain. Prices for Northern foundry iron are strong, and buyers are keeping a close eye on announcements that are soon due on the fourth quarter price structure. New buying is growing, though it is necessarily limited by the fact that sellers are holding to code practices and will sell now only for delivery through September. Automobile foundry books are in excellent condition, and castings makers for agricultural implements and machine tools are well engaged.

Cast Iron Pipe

Demand remains very light and sellers must keep busy on projects that are in the formative stage. On this basis many prices have been quoted, but there the matter rests until the new Government money starts to flow, which some think will not come before the start of the new year. Another factor that is important in this market is the growing disposition on the part of taxpayers to avoid further debt by local governments no matter what the inducements in the forms of interest rates and free grants.

Reinforcing Bars

Awards of three of the Mississippi River projects add about 2000 tons to shop books. In all other respects the market is quiet, even to a diminishing number of small tonnage jobs. However, shops have fair backlogs, and some of them, operating near the 80 per cent of capacity mark, report the largest pay rolls since 1929. A new and large source of reinforcing bar tonnage will be tapped when the State of Illinois starts its under-pass program. Many plans are already prepared, but bids will probably not be taken until September. About 140 structures are contemplated.

Rails

Miscellaneous orders, representing the prompt needs of various Western railroads, total 2000 tons, which will help materially in supporting rolling schedules, which will now extend well into the first half of September. There is a small amount of new rail inquiry now developing for deliveries that will be wanted near the end of the summer. The fall contracting period is still an uncertain quantity, and there are some in the trade who are of the opinion that buying may come later than usual this year. Accessory business is light and spotty.

Plates

The city of Chicago has ordered 315 tons of welded pipe, and there is an inquiry out for 140 miles of 8-in. gas pipe. Most of the Mississippi River work let so far has been taken by fabricators to the east of Chicago and consequently local plate mills are getting little benefit from that source. The railroad equipment market is exceptionally dull, but reports will not down that cars will be bought in attractive numbers before the end of the year. There is also promise in the way of new refinery work as the result of a new cracking process which will require modernization of plants.

Sheets

Output is averaging 80 per cent or higher, with some units engaged at capacity. Sizable automobile releases are again in the market, and shipments to those plants will grow as the fall approaches. Roofing and downspout manufacturers are expected to come into the market in a broad way about the first week in September.

Wire Products

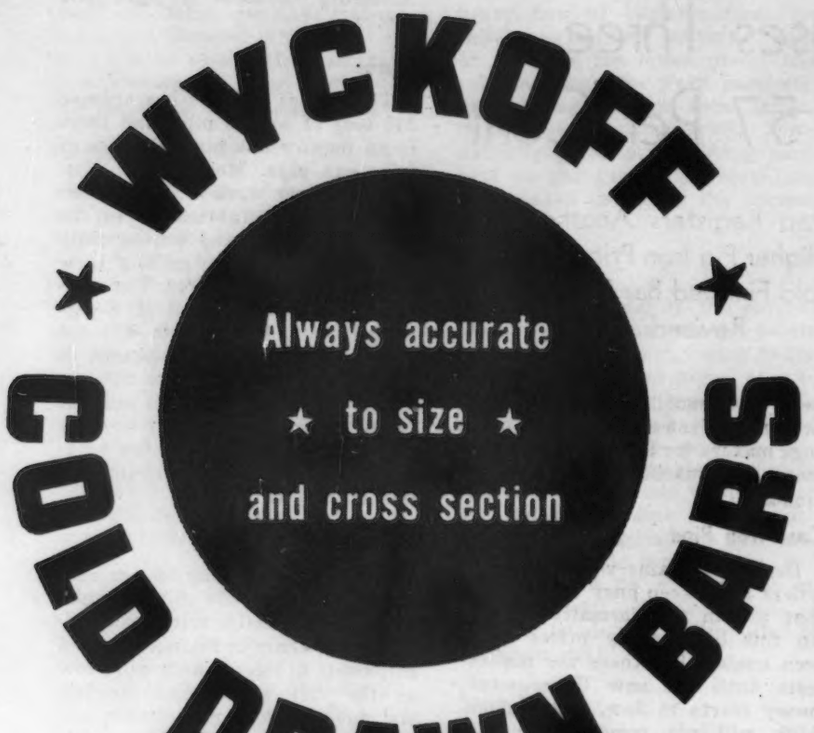
Business remains steady, but sellers are anticipating that fall buying will get under way in a week or ten days. Another factor which should soon be felt is that of Government spending, which is counted on to draw heavily against the supplies of local dealers. Jobbers indicate that they are now studying their fall requirements but they have not as yet put out inquiries. Automobile plants so far have found little need for wire products for new models, and it may be early September before that movement starts. The utilities remain dull, and radio manufacturers are taking copper wire in limited quantities. TVA requirements, which have been rather liberal, are now dwindling.

Cold-Finished Bars

Demand is in fair volume but spotty. Changes in the extras for this commodity are under consideration.

Structural Material

Awards for the week total 2600 tons and fresh inquiries aggregate 5500 tons. Bids on Mississippi River dam No. 18 at Burlington, Iowa, were taken today at Rock Island. Warner Brothers Construction Co., Chicago, was low bidder on dam No. 7 at Dresbach, Minn. The Burlington is in the market for a 350-ton bridge to replace a



Once you have determined the size, shape and physical characteristics of the steel you require for your particular operations, you can depend on WYCKOFF to meet your Cold Drawn Steel needs with the exactness of a laboratory formula.

In fact every length of WYCKOFF Cold Drawn Steel is the product of progressive scientific metallurgical control from the molten metal to the finished bar—every length backed by a complete history of its physical and chemical "pedigree".

Absolute uniformity, bar after bar is the result . . . correct in analysis, size, straightness, with a smooth, bright surface and superior machining qualities that enables you to still further reduce your production costs.

WYCKOFF DRAWN STEEL COMPANY

General Offices: First National Bank Bldg., Pittsburgh, Pa.
Mills at Ambridge, Pa. and Chicago, Ill.
Manufacturers of Cold Drawn Steels
Turned and Polished Shafting Turned and Ground Shafting

structure taken out by flood early in the summer.

Bars

The new extra cards are now in effect. Mills are calling particular attention to elimination of the extra for forging quality which results, after applying size extras, to an average saving to customers of about $2 a ton. Extras have also been eliminated for silicon content up to 0.30 per cent maximum. Releases are coming much more freely from parts makers and automobile plants, many of which are now definitely past the experimental stage in their new model programs.

Scrap

Mills have again bought round tonnages of heavy melting steel, and prices are 50c. a ton higher than a week ago. This is contrary to the expectations of some dealers, who had been looking for a technical correction under the belief that prices had run up too fast and that the backfill of the market would not support prices. A strong development is the brisk demand from foundries which, by the character of their orders, indicate that their melt is heavier. There is also some anticipatory buying on the part of automobile foundries. Higher prices have freed supplies which are readily being absorbed but they have permitted brokers to lower their bid prices.

Shipbuilding Still Gaining Gradually

CONTINUANCE of the recent small but steady increase in the volume of merchant vessels being constructed throughout the world is shown by returns just made to Lloyd's Register of Shipping from all maritime countries except Russia, for which authentic figures have not been available for some time past. The returns cover all ships of 100 gross tons and upward under way during the quarter ended June 30.

Although the gain for all countries over the quarter ended March 31 is only about 13,000 gross tons, an increase of over 40,000 tons is shown for Germany alone. For Holland there was a gain of 15,000 tons, and for Sweden one of 10,000 tons. For the United States there was an advance of about 6500 tons, and for Great Britain and Ireland one of 4500 tons, with smaller gains for Spain and Norway. Offsetting these increases there are losses of 71,000 tons for France, of 13,000 tons for Japan, and smaller declines for Denmark and Italy.

Of the total of 1,282,531 gross tons now under construction throughout the world, 43.7 per cent is being built in Great Britain and Ireland, 2 per cent in the United States, and 54.3 per cent in all other maritime countries combined.

The PWA has allotted a grant of $662,727 to the University of Missouri, at Columbia, pending approval of President Roosevelt, which, together with $810,000 appropriated by the State, will be used for building improvements as follows: new education building, $350,000; new wild life building addition to the biology building, $30,000; new hospital unit, $210,000; new dairy building, $160,000; new journalism unit, $150,000; addition to library building, $310,000; completion of home economics building, $40,000. Jamieson & Spearl, Arcade Building, St. Louis, are architects.

Chemical Pumps.—Cleveland Brass Mfg. Co., Cleveland. Catalog. Acimet chemical pumps and valves. Describes particular adaptability for handling pickling acids. Diagrams, tables of flow calculations and industrial listing of best suited types.

Prices of Finished Steel and Iron Products

BARS, PLATES, SHAPES

Iron and Steel Bars

Soft Steel	*Base per Lb.*
F.o.b. Pittsburgh	1.80c.
F.o.b. Chicago	1.85c.
F.o.b. Gary	1.85c.
F.o.b. Duluth	1.95c.
Del'd Detroit	1.95c.
F.o.b. Cleveland	1.85c.
F.o.b. Buffalo	1.90c.
Del'd Philadelphia	2.11c.
Del'd New York	2.15c.
F.o.b. Birmingham	†1.95c.
F.o.b. cars dock Gulf ports	2.20c.
F.o.b. cars Pacific ports	2.35c.

Rail Steel

(For merchant trade)

F.o.b. Pittsburgh	1.70c.
F.o.b. Chicago	1.75c.
F.o.b. Gary	1.75c.
F.o.b. Moline, Ill.	1.75c.
F.o.b. Cleveland	1.75c.
F.o.b. Buffalo	1.80c.
F.o.b. Birmingham	1.85c.
F.o.b. cars dock Gulf ports	2.10c.
F.o.b. cars dock Pacific ports	2.25c.

Billet Steel Reinforcing

(Straight lengths as quoted by distributers)

F.o.b. Pittsburgh	2.05c.
F.o.b. Chicago	2.10c.
F.o.b. Gary	2.10c.
Del'd Detroit	2.20c.
F.o.b. Cleveland	2.10c.
F.o.b. Youngstown	2.10c.
F.o.b. Buffalo	2.10c.
F.o.b. Birmingham	2.10c.
F.o.b. cars dock Gulf ports	2.45c.
F.o.b. cars dock Pacific ports	2.45c.

Rail Steel Reinforcing

(Straight lengths as quoted by distributers)

F.o.b. Pittsburgh	1.90c.
F.o.b. Chicago	1.95c.
F.o.b. Gary	1.95c.
F.o.b. Cleveland	1.95c.
F.o.b. Youngstown	1.95c.
F.o.b. Buffalo	1.95c.
F.o.b. Birmingham	1.95c.
F.o.b. cars dock Gulf ports	2.30c.
F.o.b. cars dock Pacific ports	2.30c.

Iron

F.o.b. Chicago	1.80c.
F.o.b. Terre Haute, Ind.	1.75c.
F.o.b. Louisville, Ky.	2.10c.
F.o.b. Danville, Pa.	1.80c.
F.o.b. Berwick, Pa.	1.70c.

Cold Finished Bars and Shafting*

	Base per Lb.
F.o.b. Pittsburgh	1.95c.
F.o.b. Chicago	2.00c.
F.o.b. Gary	2.00c.
F.o.b. Cleveland	2.00c.
F.o.b. Buffalo	2.05c.
Del'd Detroit	2.15c.
Del'd eastern Michigan	2.20c.

* In quantities of 10,000 to 19,000 lb.

Fence and Sign Posts

Angle Line Posts	*Base per Net Ton*
F.o.b. Pittsburgh	$50.00
F.o.b. Chicago	50.00
F.o.b. Duluth	51.00
F.o.b. Cleveland	50.00
F.o.b. Birmingham	53.00
F.o.b. Houston, Orange, Beaumont, Galveston	59.00
F.o.b. Mobile	58.00
F.o.b. New Orleans, Lake Charles, Corpus Christi	59.00
F.o.b. cars dock Pacific ports	63.00

Plates

	Base per Lb.
F.o.b. Pittsburgh	1.80c.
F.o.b. Chicago	1.85c.
F.o.b. Gary	1.85c.
Del'd Cleveland	1.995c.
F.o.b. Coatesville	1.90c.
F.o.b. Sparrows Point	1.90c.
Del'd Philadelphia	1.99c.
Del'd New York	2.09c.
F.o.b. Birmingham	1.95c.
F.o.b. cars dock Gulf ports	2.20c.
F.o.b. cars dock Pacific ports	2.35c.
Wrought iron plates, f.o.b. P'gh	3.20c.

Floor Plates

F.o.b. Pittsburgh	3.35c.
F.o.b. Chicago	3.40c.
F.o.b. Coatesville	3.45c.
F.o.b. cars dock Gulf ports	3.75c.
F.o.b. cars dock Pacific ports	3.90c.

Structural Shapes

	Base per Lb.
F.o.b. Pittsburgh	1.80c.
F.o.b. Chicago	1.85c.
Del'd Cleveland	1.995c.
F.o.b. Buffalo	1.90c.
F.o.b. Bethlehem	1.90c.
Del'd Philadelphia	2.015c.
Del'd New York	2.0625c.
F.o.b. Birmingham (standard)	1.95c.
F.o.b. cars dock Gulf ports	2.20c.
F.o.b. cars dock Pacific ports	2.35c

Steel Sheet Piling

	Base per Lb.
F.o.b. Pittsburgh	2.15c.
F.o.b. Chicago	2.25c.
F.o.b. Buffalo	2.25c.
F.o.b. cars dock Gulf ports	2.60c.
F.o.b. cars dock Pacific ports	2.60c.

SHEETS, STRIP, TIN PLATE TERNE PLATE

Sheets

Hot Rolled

	Base per Lb.
No. 10, f.o.b. Pittsburgh	1.85c.
No. 10, f.o.b. Gary	1.95c.
No. 10, del'd Detroit	2.05c.
No. 10, del'd Phila.	2.16c.
No. 10, f.o.b. Birmingham	2.00c.
No. 10, f.o.b. cars dock Pacific ports	2.40c.

Hot-Rolled Annealed

No. 24, f.o.b. Pittsburgh	2.40c.
No. 24, f.o.b. Gary	2.50c.
No. 24, del'd Detroit	2.60c.
No. 24, del'd Phila.	2.71c.
No. 24, f.o.b. Birmingham	2.55c.
No. 24, f.o.b. cars dock Pacific ports	3.05c.
No. 24, wrought iron, Pittsburgh	4.30c.

Heavy Cold-Rolled

No. 10 gage, f.o.b. Pittsburgh	2.50c.
No. 10 gage, f.o.b. Gary	2.60c.
No. 10 gage, del'd Detroit	2.70c.
No. 10 gage, del'd Phila	2.81c.
No. 10 gage, f.o.b. Birmingham	2.65c.
No. 10 gage, f.o.b. cars dock Pacific ports	3.10c.

Light Cold-Rolled

No. 20 gage, f.o.b. Pittsburgh	2.95c.
No. 20 gage, f.o.b. Gary	3.05c.
No. 20 gage, del'd Detroit	3.15c.
No. 20 gage, del'd Phila.	3.26c.
No. 20 gage, f.o.b. Birmingham	3.10c.
No. 20, f.o.b. cars dock Pacific ports	3.50c.

Galvanized Sheets

No. 24 gage, f.o.b. Pittsburgh	3.10c.
No. 24, f.o.b. Gary	3.20c.
No. 24, del'd Phila.	3.41c.
No. 24, f.o.b. Birmingham	3.25c.
No. 24, f.o.b. cars dock Pacific ports	3.70c.
No. 24, wrought iron, Pittsburgh	4.95c.

Long Ternes

No. 24, unassorted 8-lb. coating f.o.b. Pittsburgh	3.40c.
F.o.b. Gary	3.50c.
F.o.b. cars dock Pacific ports	4.10c.

Vitreous Enameling Stock

No. 20, f.o.b. Pittsburgh	3.10c.
No. 20, f.o.b. Gary	3.20c.
No. 20, f.o.b. Birmingham	3.70c.
No. 20, f.o.b. cars dock Pacific ports	3.70c.
No. 10, f.o.b. Pittsburgh	2.80c.
No. 10, f.o.b. Gary	2.90c.
No. 10, f.o.b. Birmingham	3.10c.
No. 10, f.o.b. cars dock Pacific ports	3.10c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh	2.75c.
No. 28, Gary	2.85c.
No. 28, cars dock Pacific Coast ports	3.35c.

Tin Plate

	Per Base Box
Standard cokes, f.o.b. P'gh district mill	$5.25
Standard cokes, f.o.b. Gary	5.35
Standard cokes, f.o.b. cars dock Pacific ports	5.90

Terne Plate

(F.o.b. Pittsburgh)

(Per Package, 20 x 28 in.)

8-lb. coating I.C.	$10.00
15-lb. coating I.C.	12.00
20-lb. coating I.C.	13.00
25-lb. coating I.C.	14.00
30-lb. coating I.C.	15.25
40-lb. coating I.C.	17.50

Hot-Rolled Hoops, Bands, Strips and Flats under ¼ In.

	Base per Lb.
All widths up to 24 in., P'gh	1.85c.
All widths up to 24 in., Chicago	1.95c.
All widths up to 24 in., del'd Detroit	2.05c.
All widths up to 24 in., Birmingham	2.00c.
Cooperage stock, Pittsburgh	1.95c.
Cooperage stock, Chicago	2.05c.

Cold-Rolled Strips

	Base per Lb.
F.o.b. Pittsburgh	2.60c.
F.o.b. Cleveland	2.60c.
Del'd Chicago	2.895c.
F.o.b. Worcester	2.80c.

Fender Stock

No. 14, Pittsburgh or Cleveland	2.90c.
No. 14, Worcester	3.30c.
No. 20, Pittsburgh or Cleveland	3.30c.
No. 20, Worcester	3.70c.

Hot-Rolled Rail Steel Strips

	Base per Lb.
F.o.b. Pittsburgh	1.70c.
F.o.b. Chicago	1.75c.
F.o.b. Birmingham	1.85c.

WIRE PRODUCTS

(Carload lots, f.o.b. Pittsburgh and Cleveland.)

To Manufacturing Trade	*Per Lb.*
Bright wire	2.30c.
Spring wire	2.90c.

Chicago prices on products sold to the manufacturing trade are $1 a ton above Pittsburgh or Cleveland. Worcester and Duluth prices are $2 a ton above, Birmingham $3 above, and Pacific Coast prices $9 a ton above Pittsburgh or Cleveland.

To Jobbing Trade

Qualified jobbers are entitled to a reduction of 20c. a 100 lb. from the base price on carload shipments to stock, and of 10c. a 100 lb. on less-carload shipments to stock.

	Base per Keg
Standard wire nails	$2.60
Smooth coated nails	2.60
Galvanized nails:	
15 gage and coarser	4.60
16 gage and finer	5.10

	Base per 100 Lb.
Annealed fence wire	$2.45
Galvanized fence wire	2.80
Polished staples	3.30
Galvanized staples	3.55
Barbed wire, galvanized	3.00
Woven wire fence, base column	63.00

Chicago and Anderson, Ind., mill prices are $1 a ton over Pittsburgh base (on all products except woven wire fence, for which the Chicago price is $2 above Pittsburgh); Duluth, Minn., and Worcester, Mass., mill prices are $2 a ton over Pittsburgh (except for woven wire fence at Duluth, which is $3 over Pittsburgh), and Birmingham mill prices are $3 a ton over Pittsburgh.

On wire nails, barbed wire, staples and fence wire, prices at Houston, Galveston and Corpus Christi, Tex., New Orleans, Lake Charles, La., and Mobile, Ala., are $6 a ton over Pittsburgh, while Pacific Coast prices are $8 over Pittsburgh. Exception: on fence wire Pacific Coast prices are $11 a ton above Pittsburgh.

On staples and barbed wire, prices of $6 a ton above Pittsburgh are also quoted at Beaumont and Orange, Tex.

Wire Hoops, Twisted or Welded

	Off List
F.o.b. Pittsburgh	35 and 2½ off
F.o.b. Chicago	35 off

STEEL AND WROUGHT PIPE AND TUBING

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

F.o.b. Pittsburgh only on wrought iron pipe.

Butt Weld

Steel			Wrought Iron		
Inches	Black	Galv.	Inches	Black	Galv.
⅛	51½	29½	⅛	+91¼	+132
¼ to ⅜	53½	35	¼ & ⅜	+1½	+21½
½	58½	47	½	31½	15
¾	62	52	¾	36½	20½
1 to 3	64	55	1&1¼	39½	25½
			1½	42½	28
			2	41½	26

Lap Weld

2	60	51	2	37	22½
2½ to 3	63	54	2½ to 3½	38	25
3½ to 6	65	56	4 to 8	40	28½
7 and 8	64	54	9 to 12	38	24½
9 and 10	63½	53½			
11 and 12	62½	52½			

Butt Weld, extra strong, plain ends

⅛	48½	32½	⅛	+13	+45½
¼ to ⅜	51	35	¼ & ⅜	+2½	+34½
½	56½	47½	½	32½	17½
¾	61	52	¾	37½	22½
1 to 3	63	55	1 to 2	43½	29

Lap Weld, extra strong, plain ends

2	58	50	2	40	26
2½ to 3	62	54	2½ to 4	45½	33
3½ to 6	65½	57½	4½ to 6	45	33½
7 and 8	64½	54½	7 & 8	46	33
9 and 10	63½	53½	9 to 12	41½	30
11 and 12	62½	52½			

On standard steel pipe an extra 5% off is allowed on sales to consumers while two 5's off apply on sales to jobbers. On less-than-carload shipments prices are determined by adding 20 and 25% and the carload freight rate to the base card. On structural steel pipe the base card is reduced 2 points and two 5's off are allowed to consumers and three 5's off to jobbers.

Note—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Seamless Steel Commercial Boiler Tubes and Locomotive Tubes

(Net base prices per 100 ft. f.o.b. Pittsburgh, in carload lots)

		Cold Drawn	Hot Rolled
1 in. o.d.	13 B.W.G.	$ 8.60	$ 7.82
1¼ in. o.d.	13 B.W.G.	10.19	9.38
1½ in. o.d.	13 B.W.G.	11.26	10.33
1¾ in. o.d.	13 B.W.G.	12.81	11.84
2 in. o.d.	13 B.W.G.	14.35	13.04
2¼ in. o.d.	13 B.W.G.	16.00	14.54
2½ in. o.d.	12 B.W.G.	17.61	16.01
2¾ in. o.d.	12 B.W.G.	19.29	17.54
2¾ in. o.d.	12 B.W.G.	20.45	18.59
3 in. o.d.	12 B.W.G.	21.45	19.50
4½ in. o.d.	10 B.W.G.	41.08	37.35
3½ in. o.d.	11 B.W.G.	27.09	24.62
4 in. o.d.	10 B.W.G.	33.60	30.54
4½ in. o.d.	10 B.W.G.	41.08	37.35
5 in. o.d.	9 B.W.G.	51.56	46.87
6 in. o.d.	7 B.W.G.	79.15	71.96

Extras for less-carload quantities:

25,000 lb. or ft. to 39,999 lb. or ft.	5 %
12,000 lb. or ft. to 24,999 lb. or ft.	12½ %
6,000 lb. or ft. to 11,999 lb. or ft.	25 %
2,000 lb. or ft. to 5,999 lb. or ft.	35 %
Under 2,000 lb. or ft.	50 %

Lapweld Steel and Knobbled Charcoal Iron Pressure Tubes

(Net base prices per 100 ft. f.o.b. Pittsburgh, in carload lots)

		Steel	Iron
1½ in. o.d.	13 B.W.G.	$ 9.72	$20.16
1¾ in. o.d.	13 B.W.G.	11.06	21.84
2 in. o.d.	13 B.W.G.	12.38	17.33
2¼ in. o.d.	13 B.W.G.	13.79	19.58
2½ in. o.d.	12 B.W.G.	16.58	24.19
2¾ in. o.d.	12 B.W.G.	17.54	26.46
3 in. o.d.	12 B.W.G.	18.35	28.39
3½ in. o.d.	11 B.W.G.	21.56	33.95
3½ in. o.d.	11 B.W.G.	23.15	36.16
4 in. o.d.	10 B.W.G.	28.66	45.34
4½ in. o.d.	10 B.W.G.	35.22	56.42
5 in. o.d.	9 B.W.G.	44.25	81.84
6 in. o.d.	7 B.W.G.	68.14	102.46

Quantity Extras:

40,000 lb. or ft.	base
25,000 lb. or ft. to 39,999 lb. or ft.	plus 5%
10,000 lb. or ft. to 24,999 lb. or ft.	plus 12½ %
2,000 lb. or ft. to 9,999 lb. or ft.	plus 25%
Under 2,000 lb. or ft.	plus 40%

CAST IRON WATER PIPE

	Per Net Ton
*6-in. and larger, del'd Chicago	$48.40
*4-in., del'd Chicago	51.40
6-in. and larger, del'd New York	45.20
4-in. del'd New York	48.20
*6-in. and larger, Birmingham	40.60
*4-in. Birmingham	43.60
6-in. and larger, f.o.b. dock, San Francisco or Los Angeles	48.00
F.o.b. dock, Seattle	48.50
4-in., f.o.b. dock, San Francisco or Los Angeles	51.00
F.o.b. dock, Seattle	51.50

Class "A" and gas pipe, $3 extra.

*Prices for lots of less than 200 tons. For 200 tons and over, 6-in. and larger is $39, Birmingham, and $47.40, delivered Chicago, and 4-in. pipe, $42, Birmingham, and $50.40 a ton, delivered Chicago.

RAILROAD MATERIALS

Rails and Track Supplies

F.o.b. Mill

Standard rails, heavier than 60 lb., per gross ton	$36.37½
Angle bars, per 100 lb.	2.55

F.o.b. Code Basing Points

Light rails (from billets) per gross ton	$35.00
Light rails (from rail steel) per gross ton	34.00

	Base per 100 Lb.
Spikes, 9/16 in. and larger	$2.40
Spikes, ½ in. and smaller	2.40
Tie plates, steel	1.90
Tie plates, Pacific Coast ports	2.00
Track bolts, to steam railroads	3.55
Track bolts, to jobbers, all sizes (per 100 count)	70 per cent off list

Basing points on light rails are Pittsburgh, Chicago and Birmingham; on spikes and tie plates, Pittsburgh, Chicago, Buffalo, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Birmingham and Pacific Coast ports; on tie plates alone, Steelton, Pa.; on spikes alone, Cleveland, Youngstown, Lebanon, Pa., Columbia, Pa., Richmond, Va.

BOLTS, NUTS, RIVETS AND SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

	Per Cent Off List
Machine bolts	70, 10 and 5
Carriage bolts	70, 10 and 5
Lag bolts	70, 10 and 5
Plow bolts, Nos. 1, 2, 3 and 7 heads	70, 10 and 5
Hot-pressed nuts, blank or tapped, square	70, 10 and 5
Hot-pressed nuts, blank or tapped, hexagons	70, 10 and 5
C.p.c. and t. square or hex. nuts, blank or tapped	70, 10 and 5
Semi-finished hexagon nuts, U.S.S. and S.A.E., all sizes to and incl. 1 in. diameter	70, 10 and 5
Larger than 1 in. diameter	70
Stove bolts in packages, Pittsburgh	75
Stove bolts in packages, Chicago	75
Stove bolts in packages, Cleveland	75
Stove bolts in bulk, Pittsburgh	83
Stove bolts in bulk, Chicago	83
Stove bolts in bulk, Cleveland	83
Tire bolts	60 and 5

Large Rivets

(½-in. and larger)

	Base per 100 Lb.
F.o.b. Pittsburgh or Cleveland	$2.90
F.o.b. Chicago	3.00
F.o.b. Birmingham	3.05

Small Rivets

(7/16-in. and smaller)

	Per Cent Off List
F.o.b. Pittsburgh	70 and 5
F.o.b. Cleveland	70 and 5
F.o.b. Chicago and Birm'g'm	70 and 5

Cap and Set Screws

(Freight allowed up to but not exceeding 65c. per 100 lb. on lots of 200 lb. or more)

	Per Cent Off List
Milled cap screws, 1 in. dia. and smaller	85 and 10
Milled standard set screws, case hardened, 1 in. dia. and smaller	75 and 10
Milled headless set screws, cut thread ¾ in. and smaller	75
Upset hex. head cap screws, U.S.S.S. or S.A.E. thread, 1 in. dia. and smaller	87½
Upset set screw, cut and oval point	80
Milled studs	65 to 65 and 10

Alloy and Stainless Steel

Alloy Steel Ingots

F.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem. Uncropped ..... $10 per gross ton

Alloy Steel Blooms, Billets and Slabs

F.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem. Base price, $49 a gross ton.

Alloy Steel Bars

Price del'd Detroit is $52.

F.o.b. Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton. Open-hearth grade, base ..... 2.45c. Delivered price at Detroit is ..... 2.60c.

S.A.E. Series Numbers	Alloy Differential per 100 lb.
2000 (½ Nickel)	$0.25
2100 (2½% Nickel)	0.55
2300 (3½% Nickel)	1.50
2500 (5% Nickel)	2.25
3100 Nickel Chromium	0.55
3200 Nickel Chromium	1.35
3300 Nickel Chromium	3.80
3400 Nickel Chromium	3.20
4100 Chromium Molybdenum (0.15 to 0.25 Molybdenum)	0.50
4100 Chromium Molybdenum (0.25 to 0.40 Molybdenum)	0.70
4600 Nickel Molybdenum (0.20 to 0.30 Molybdenum) (1.50 to 2.00 Nickel)	1.05
5100 Chromium Steel (0.60 to 0.90 Chromium)	0.35
5100 Chromium Steel (0.80 to 1.10 Chromium)	0.45
5100 Chromium Spring Steel	base
6100 Chromium Vanadium Bar	1.20
6100 Chromium Vanadium Spring Steel	0.70
Chromium Nickel Vanadium	1.50
Carbon Vanadium	0.95

These prices are for hot-rolled steel bars. The differential for most grades in electric furnace steel is 50c. higher. The differential for cold-drawn bars ½c. per lb. higher with separate extras. Blooms, billets and slabs under 4x4 in. or equivalent are sold on the bar base. Slabs with a section area of 16 in. and 2½ in. thick or over take the billet base. Sections 4x4 in. to 10x10 in. or equivalent carry a gross ton price, which is the net price for bars for the same analysis. Larger sizes carry extras.

Alloy Cold-Finished Bars

F.o.b. Pittsburgh, Chicago, Gary, Cleveland or Buffalo. 2.95c. base per lb.

STAINLESS STEEL No. 302

(17 to 19% Cr. 7 to 9% Ni. 0.08 to 0.20% C.)

(Base Prices f.o.b. Pittsburgh)

	Per Lb.
Forging billets	19.55c.
Rerolling slabs	15c.
Bars	22c.
Plates	26c.
Structural shapes	23.
Sheets	33c.
Hot-rolled strip	20¾c.
Cold-rolled strip	27c.
Drawn wire	23c.

Raw and Semi-Finished Steel

Carbon Steel Rerolling Ingots

F.o.b. Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham. Uncropped ..... $29 per gross ton

Carbon Steel Forging Ingots

F.o.b. Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Birmingham. Uncropped ..... $31 per gross ton

Billets, Blooms and Slabs

F.o.b. Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham.

	Per Gross Ton
Rerolling	$27.00
Forging quality	32.00

Delivered Detroit

Rerolling	$30.00
Forging	35.00

Billets Only F.o.b. Duluth

Rerolling	$29.00
Forging	34.00

Sheet Bars

F.o.b. Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

	Per Gross Ton
Open-hearth or Bessemer	$28.00

Skelp

F.o.b. Pittsburgh, Chicago, Youngstown, Buffalo, Coatesville, Pa., Sparrows Point, Md.

	Per Lb.
Grooved	1.70c.
Universal	1.70c.
Sheared	1.70c.

Tube Rounds

	Base per Lb.
F.o.b. Pittsburgh	1.80c.
F.o.b. Chicago	1.85c.
F.o.b. Cleveland	1.85c.
F.o.b. Buffalo	1.90c.
F.o.b. Birmingham	1.95c.

Wire Rods

(Common, base)

	Per Gross Ton
F.o.b. Pittsburgh	$38.00
F.o.b. Cleveland	38.00
F.o.b. Chicago	39.00
F.o.b. Anderson, Ind.	39.00
F.o.b. Youngstown	39.00
F.o.b. Worcester, Mass.	40.00
F.o.b. Birmingham	41.00
F.o.b. San Francisco	47.00
F.o.b. Galveston	44.00

Pig Iron and Ferroalloys

PIG IRON

PRICES PER GROSS TON AT BASING POINTS

Basing Points	No. 2 Fdry.	Malleable	Basic	Bessemer
Everett, Mass.	$19.50	$20.00	$19.00	$20.50
Bethlehem, Pa.	19.50	20.00	19.00	20.50
Birdsboro, Pa.	19.50	20.00	19.00	20.50
Swedeland, Pa.	19.50	20.00	19.00	20.50
Steelton, Pa.	....	....	19.00	....
Sparrows Point, Md.	19.50	....	19.00	....
Neville Island, Pa.	18.50	18.50	18.00	19.00
Sharpsville, Pa.	18.50	18.50	18.00	19.00
Youngstown	18.50	18.50	18.00	19.00
Buffalo	18.50	19.00	17.50	19.50
Erie, Pa.	18.50	19.00	18.00	19.50
Cleveland	18.50	18.50	18.00	19.00
Toledo, Ohio	18.50	18.50	18.00	19.00
Jackson, Ohio	20.25	20.25	19.75	20.75
Detroit	18.50	18.50	18.00	19.00
Hamilton, Ohio	18.50	18.50	18.00	19.00
Chicago	18.50	18.50	18.00	19.00
Granite City, Ill.	18.50	18.50	18.00	....
Duluth, Minn.	19.00	19.00	....	19.50
Birmingham	14.50	14.50	13.50	19.00
Provo, Utah	17.50	....	17.00	....

DELIVERED PRICES PER GROSS TON AT CONSUMING CENTERS

	No. 2 Fdry.	Malleable	Basic	Bessemer
Boston Switching District From Everett, Mass.	$20.00	$20.50	$19.50	$21.00
Brooklyn From East. Pa.	21.9289	22.4289	21.9289	22.9289
Newark or Jersey City, N. J. From East. Pa.	20.9873	21.4873	20.4873	21.9873
Philadelphia From Eastern Pa.	20.3132	20.8132	19.8132	21.3132
Cincinnati From Hamilton, Ohio	19.5807	19.5807	19.0807	20.0807
Canton, Ohio From Cleveland and Youngstown	19.3402	19.8402	19.3402	20.3402
Columbus, Ohio From Hamilton, Ohio	20.64	20.64	....	....
Mansfield, Ohio From Cleveland and Toledo	20.3832	20.3832	....	....
Indianapolis From Hamilton, Ohio	20.9289	20.9289	....	....
South Bend, Ind. From Chicago	20.6935	20.6935	....	....
Milwaukee From Chicago	19.57	19.57	....	....
St. Paul From Duluth	20.94	....	....	....
Davenport, Iowa From Chicago	20.3832	20.3832	....	....
Kansas City From Granite City	21.2178	21.2178	....	....
San Francisco, Los Angeles or Seattle. From Provo	22.315	....	....	....

Delivered prices on Southern iron for shipment to Northern points are 38c. a gross ton below delivered prices from the nearest Northern basing points.

LOW PHOSPHORUS PIG IRON

Basing points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y. $23.50

GRAY FORGE PIG IRON

Valley furnace	$18.00
Pittsburgh district furnace	18.00

CHARCOAL PIG IRON

Lake Superior furnace	$21.00
Delivered Chicago	24.2528
Delivered Buffalo	24.595

CANADA

Pig Iron

Per gross ton:

Delivered Toronto

No. 1 fdy., sil. 2.25 to 2.75	$21.00
No. 2 fdy., sil. 1.75 to 2.75	20.50
Malleable	21.00

Delivered Montreal

No. 1 fdy., sil. 2.25 to 2.75	$22.50
No. 2 fdy., sil. 1.75 to 2.25	22.00
Malleable	22.50
Basic	22.00

FERROALLOYS

Ferromanganese

F.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans.

	Per Gross Ton
Domestic, 80% (carload)	$85.00

Spiegeleisen

	Per Gross Ton Furnace
Domestic, 19 to 21%	$26.00
50-ton lots 3-mo. shipment	24.00
F.o.b. New Orleans	26.00

Electric Ferrosilicon

	Per Gross Ton Delivered
50% (carloads)	$77.50
50% (ton lots)	85.00
75% (carloads)	126.00
75% (ton lots)	136.00

Silvery Iron

F.o.b. Jackson, Ohio, Furnace

Per Gross Ton		*Per Gross Ton*	
6%	$22.75	12%	$29.25
7%	23.75	13%	30.75
8%	24.75	14%	32.25
9%	25.75	15%	33.75
10%	26.75	16%	35.25
11%	27.75	17%	36.75

The lower all-rail delivered price from Jackson or Buffalo is quoted with freight allowed. Base prices at Buffalo are $1.25 a ton higher than at Jackson.

Manganese 2 to 3%, $1 a ton additional. For each unit of manganese over 3%, $1 a ton additional.

Bessemer Ferrosilicon

F.o.b. Jackson, Ohio, Furnace

Per Gross Ton		*Per Gross Ton*	
10%	$27.75	14%	$33.25
11%	28.75	15%	34.75
12%	30.25	16%	36.25
13%	31.75	17%	37.75

Manganese 2 to 3%, $1 a ton additional. For each unit of manganese over 3%, $1 a ton additional. Phosphorus 0.75% or over, $1 ton additional.

Base prices at Buffalo are $1.25 a ton higher than at Jackson.

Other Ferroalloys

Ferrotungsten, per lb. contained W. del., carloads	$1.35 to $1.45
Ferrotungsten, less carloads	1.45 to 1.55
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr. per lb. contained Cr. delivered, in carloads	10.00c.
Ferrochromium, 2% carbon	16.50c. to 17.00c.
Ferrochromium, 1% carbon	17.50c. to 18.00c.
Ferrochromium, 0.10% carbon	19.50c. to 20.00c.
Ferrochromium, 0.06% carbon	20.00c. to 20.50c.
Ferrovanadium, del. per lb. contained V.	$2.70 to $2.90
Ferrocarbontitanium, 15 to 18% Ti, 6 to 8% C. f.o.b. furnace carload and contract per net ton	$137.50
Ferrophosphorus, electric, or blast furnace material, in carloads, 18%, Rockdale, Tenn., base, per gross ton with $2 unitage	50.00
Ferrophosphorus, electric, 24%, f.o.b. Anniston, Ala., per gross ton with $2.75 unitage	65.00
Ferromolybdenum, per lb. Mo., del.	95c.
Calcium molybdate, per lb. Mo., del.	80c
Silico spiegel, per ton, f.o.b. furnace, car lots	$38.00
Ton lots or less per ton	45.50
Silico-manganese, gross ton, delivered:	
2.50% carbon grade	90.00
2% carbon grade	95.00
1% carbon grade	105.00
Spot prices	$5 a ton higher

Iron and Steel Scrap

PITTSBURGH

Per gross ton delivered consumers' yards:	
No. 1 heavy melting steel	$12.75 to $13.25
No. 2 heavy melting steel	11.50 to 12.00
No. 2 railroad wrought	12.75 to 13.25
Scrap rails	13.50 to 14.00
Rails, 3 ft. and under	14.50 to 15.00
Compressed sheet steel	12.75 to 13.25
Hand bundled sheet steel	11.00 to 11.50
Hvy. steel axle turnings	10.00 to 10.50
Machine shop turnings	8.50 to 9.00
Short shov. turnings	8.50 to 9.00
Short mixed borings and turnings	6.50 to 7.00
Cast iron borings	6.50 to 7.00
Cast iron carwheels	12.25 to 12.75
Heavy breakable cast	11.50 to 12.00
No. 1 cast	13.00 to 14.00
Railr. knuckles and couplers	14.50 to 15.00
Rail coil and leaf springs	14.50 to 15.00
Rolled steel wheels	14.50 to 15.00
Low phos. billet crops	15.50 to 16.00
Low phos. sheet bar crops	15.00 to 15.50
Low phos. punchings	14.50 to 15.00
Low phos. plate scrap	14.00 to 14.50
Steel car axles	14.25 to 14.75

CHICAGO

Delivered Chicago district consumers:	Per Gross Ton
Heavy melting steel	$12.00 to $12.50
Automobile hvy. melt. steel	11.00 to 11.50
Shoveling steel	12.00 to 12.50
Hydraulic comp. sheets	11.25 to 11.75
Drop forge flashings	9.50 to 10.00
No. 1 busheling	11.00 to 11.50
Rolled carwheels	12.75 to 13.25
Railroad tires	13.25 to 13.75
Railroad leaf springs	12.75 to 13.25
Axle turnings	11.00 to 11.50
Steel couplers and knuckles	13.25 to 13.75
Coil springs	14.25 to 14.75
Axle turnings (elec. fur.)	11.50 to 12.00
Low phos. punchings	14.50 to 15.00
Low phos. plates, 12 in. and under	14.50 to 15.00
Cast iron borings	6.75 to 7.25
Short shoveling turnings	6.75 to 7.25
Machine shop turnings	7.00 to 7.50
Rerolling rails	13.00 to 13.50
Steel rails, less than 3 ft.	13.50 to 14.00
Steel rails, less than 2 ft.	15.00 to 15.50
Angle bars, steel	14.00 to 14.50
Cast iron carwheels	12.75 to 13.25
Railroad malleable	14.75 to 15.25
Agricultural malleable	10.25 to 10.75

	Per Net Ton
Iron car axles	$15.50 to $16.00
Steel car axles	14.50 to 15.00
No. 1 railroad wrought	9.50 to 10.00
No. 2 railroad wrought	10.50 to 11.00
No. 2 busheling	6.50 to 7.00
Locomotive tires, smooth	11.50 to 12.00
Pipes and flues	7.00 to 7.50
No. 1 machinery cast	11.00 to 11.50
Clean automobile cast	10.50 to 11.00
No. 1 railroad cast	10.00 to 10.50
No. 1 agricultural cast	10.00 to 10.50
Stove plate	8.00 to 8.50
Grate bars	8.00 to 8.50
Brake shoes	8.00 to 8.50

PHILADELPHIA

Per gross ton delivered consumers' yards:	
No. 1 heavy melting steel	$11.00
No. 2 heavy melting steel	$10.00 to 10.50
Hydraulic compressed, new	10.00 to 10.50
Hydraulic compressed, old	8.00 to 8.50
Steel rails for rolling	12.50 to 13.50
Cast iron carwheels	11.00 to 11.50
Heavy breakable cast	10.50 to 11.00
No. 1 cast	11.00 to 11.50
Stove plate (steel works)	8.50
Machine shop turnings	6.00 to 6.50
No. 1 blast furnace	5.00
Heavy axle turnings	9.50 to 10.00
Cast borings	5.00 to 5.50
No. 1 low phos. heavy	13.75 to 14.25
Couplers and knuckles	13.50 to 14.00
Rolled steel wheels	13.50 to 14.00
Steel axles	16.00
Shafting	17.50
No. 1 railroad wrought	10.00 to 10.50
Spec. iron and steel pipe	9.50 to 10.00
Bundled sheets	9.50 to 10.00
No. 1 forge fire	9.50 to 10.00
Cast borings (chem.)	10.50 to 13.00

CINCINNATI

Dealers' buying prices per gross ton:	
No. 1 heavy melting steel	$9.00 to $9.50
No. 2 heavy melting steel	7.50 to 8.00
Scrap rails for melting	8.75 to 9.25
Loose sheet clippings	5.50 to 6.00
Bundled sheets	6.75 to 7.25
Cast iron borings	5.00 to 5.50
Machine shop turnings	5.25 to 5.75
No. 1 busheling	6.75 to 7.25
No. 2 busheling	3.25 to 3.75
Rails for rolling	9.75 to 10.25
No. 1 locomotive tires	8.00 to 8.50
Short rails	12.50 to 13.00
Cast iron carwheels	9.00 to 9.50
No. 1 machinery cast	10.00 to 10.50
No. 1 railroad cast	9.25 to 9.75
Burnt cast	6.75 to 7.25
Stove plate	6.75 to 7.25
Agricultural malleable	8.75 to 9.25
Railroad malleable	10.00 to 10.50

CLEVELAND

Per gross ton delivered consumers' yards:	
No. 1 heavy melting steel	$11.50 to $12.00
No. 2 heavy melting steel	10.50 to 11.00
Compressed sheet steel	10.50 to 11.00
Light bundled sheet stampings	9.00 to 9.50
Drop forge flashings	10.50 to 11.00
Machine shop turnings	7.25 to 7.50
Short shoveling turnings	7.50 to 8.00
No. 1 busheling	10.50 to 11.00
Steel axle turnings	10.50 to 11.00
Low phos. billet crops	14.00 to 14.50
Cast iron borings	7.25 to 7.75
Mixed borings and short turnings	7.25 to 7.75
No. 2 busheling	7.25 to 7.75
No. 1 cast	12.50 to 13.00
Railroad grate bars	7.00 to 7.50
Stove plate	7.50 to 8.00
Rails under 3 ft.	13.00 to 13.50
Rails for rolling	15.50 to 16.00
Railroad malleable	14.50 to 15.00
Cast iron carwheels	10.75 to 11.00

BUFFALO

Per gross ton, f.o.b. Buffalo consumers' plants:	
No. 1 heavy melting steel	$11.50 to $12.00
No. 2 heavy melting scrap	10.50 to 11.00
Scrap rails	11.50 to 12.00
New hydraul. comp. sheets	10.50 to 11.00
Old hydraul. comp. sheets	9.50 to 10.00
Drop forge flashings	10.50 to 11.00
No. 1 busheling	10.50 to 11.00
Hvy. steel axle turnings	10.50 to 11.00
Machine shop turnings	6.00 to 6.50
Knuckles and couplers	12.50 to 13.00
Coil and leaf springs	12.50 to 13.00
Rolled steel wheels	12.50 to 13.00
Low phos. billet crops	14.50 to 15.00
Short shov. steel turnings	6.50 to 7.00
Short mixed borings and turnings	6.50 to 7.00
Cast iron borings	6.50 to 7.00
No. 2 busheling	7.00 to 7.50
Steel car axles	12.50 to 13.00
Iron axles	12.50 to 13.00
No. 1 machinery cast	11.50 to 12.50
No. 1 cupola cast	11.00 to 11.50
Stove plate	9.50 to 10.00
Steel rails, 3 ft. and under	13.00 to 13.50
Cast iron carwheels	11.00 to 11.50
Industrial malleable	13.00 to 13.50
Railroad malleable	13.00 to 13.50
Chemical borings	9.00 to 9.50

BOSTON

Dealers' buying prices per gross ton:	
*No. 1 heavy melting steel	$8.75 to $9.00
No. 1 heavy melting steel	7.00 to 7.40
Scrap rails	7.00 to 7.50
*No. 2 steel	7.75
No. 2 steel	6.00 to 6.40
Breakable cast	5.50 to 5.80
Machine shop turnings	2.75 to 2.90
Bundled skeleton, long	5.75 to 5.90
Forge fleshings	5.75 to 5.90
Shafting	12.00 to 12.50
Steel car axles	12.00 to 12.25
Cast iron borings, chemical	5.50 to 7.00

Per gross ton delivered consumers' yards:	
Textile cast	$9.25 to $10.00
No. 1 machinery cast	9.50 to 10.00
Stove plate	6.00 to 6.50
Railroad malleable	11.00 to 11.50

* Delivered local army base.

NEW YORK

Dealers' buying prices per gross ton:	
No. 1 heavy melting steel	*$7.50 to †$8.50
No. 2 heavy melting steel	*6.25 to †7.50
Heavy breakable cast	6.00 to 6.50
No. 1 machinery cast	7.00 to 7.50
No. 3 cast	†6.50
Stove plate	†6.25
Steel car axles	13.50 to 14.00
Shafting	12.75 to 13.00
No. 1 railroad wrought	7.00 to 7.50
No. 1 yard wrought, long	6.00 to 6.50
Spec. iron and steel pipe	4.50 to 5.00
Forge fire	5.50 to 6.00
Rails for rolling	8.50 to 9.00
Short shoveling turnings	3.00 to 3.25
Machine shop turnings	3.00 to 3.25
Cast borings	3.50 to 3.75
No. 1 blast furnace	2.00 to 2.50
Cast borings (chemical)	11.00 to 11.50
Unprepared yard iron and steel	4.00 to 4.50

Per gross ton, delivered local foundries:	
No. 1 machinery cast	$10.00
No. 1 hvy. cast (cupola size)	9.00
No. 2 cast	7.50

* For direct car loading only.
† Loading on barge.

BIRMINGHAM

Per gross ton delivered consumers' yards:	
Heavy melting steel	$7.50 to $8.00
Scrap steel rails	10.00 to 10.50
Short shoveling turnings	7.00
Stove plates	7.00
Steel axles	11.50
Iron axles	11.50
No. 1 railroad wrought	7.00
Rails for rolling	10.00 to 10.50
No. 2 cast	10.00 to 10.50
Tramcar wheels	10.00

ST. LOUIS

Per gross ton delivered consumers' yards:	
Selected heavy steel	$9.25 to $9.75
No. 1 heavy melting	8.75 to 9.25
No. 2 heavy melting	7.75 to 8.25
No. 1 locomotive tires	9.75 to 10.25
Misc. stand-sec. rails	11.00 to 11.50
Railroad springs	12.00 to 12.50
Bundled sheets	6.00 to 6.50
No. 2 railroad wrought	9.25 to 9.75
No 1 busheling	5.00 to 5.50
Cast iron borings and shoveling turnings	3.00 to 3.50
Rails for rolling	11.50 to 12.00
Machine shop turnings	2.75 to 3.25
Heavy turnings	5.50 to 6.00
Steel car axles	12.50 to 13.00
Iron car axles	15.00 to 16.00
No. 1 railroad wrought	7.00 to 7.50
Steel rails less than 3 ft.	13.00 to 13.50
Steel angle bars	10.50 to 11.00
Cast iron carwheels	8.00 to 8.50
No. 1 machinery cast	8.50 to 9.00
Railroad malleable	10.50 to 11.00
No. 1 railroad cast	8.00 to 8.50
Stove plate	6.50 to 7.00
Agricult. malleable	8.50 to 9.00

DETROIT

Dealers' buying prices per gross ton:	
Heavy melting steel	$9.00 to $9.50
Borings and short turnings	5.25 to 5.75
Long turnings	$5.00 to $5.50
No. 1 machinery cast	11.75 to 12.25
Automotive cast	11.50 to 12.00
Hydraul. comp. sheets	9.50 to 10.00
Stove plate	7.25 to 7.75
New factory busheling	8.25 to 8.75
Old No. 2 busheling	4.50 to 5.00
Sheet clippings	6.25 to 6.75
Flashings	8.00 to 8.50
Low phos. plate scrap	10.00 to 10.50

CANADA

Dealers' buying prices per gross ton:	Toronto	Montreal
Heavy melting steel	$7.00	$7.00
Rails scrap	8.00	8.00
Machine shop turnings	3.00	3.00
Boiler plate	4.50	4.50
Heavy axle turnings	4.50	4.00
Cast borings	4.00	3.50
Steel borings	2.00	2.00
Wrought pipe	3.50	3.50
Steel axles	7.00	8.00
Axles, wrought iron	7.00	8.00
No. 1 machinery cast	9.00	9.00
Stove plate	5.50	5.00
Standard carwheels	7.25	7.00
Malleable	6.75	7.00

ORES, FLUORSPAR, COKE, FUEL, REFRACTORIES

Lake Superior Ores

Delivered Lower Lake Ports

	Per Gross Ton
Old range, Bessemer, 51.50% iron	$4.80
Old range, non-Bessemer, 51.50% iron	4.65
Mesabi, Bessemer, 51.50% iron	4.65
Mesabi, non-Bessemer, 51.50% iron	.50
High phosphorus, 51.50% iron	4.40

Foreign Ore

C.i.f. Philadelphia or Baltimore

	Per Unit
Iron, low phos., copper free, 55 to 58% iron, dry Spanish or Algeria	10.50c.
Iron, low phos., Swedish, average 68½% iron	10.50c.
Iron, basic or foundry, Swedish, aver. 65% iron	9.50c.
Iron, basic or foundry, Russian, aver. 65% iron	9.50c.
Manganese, Caucasian, washed 52%	26c.
Manganese, African, Indian, 44-48%	22c.
Manganese, African, Indian, 49-51%	24c.
Manganese, Brazilian, 46 to 48½%	20c.

*Per Net Ton Unit	
Tungsten, Chinese, wolframite, duty paid, delivered	$16.00 to $16.50
Tungsten, domestic, scheelite, delivered	16.50

Per Gross Ton	
Chrome, 45% Cr_2O_3, lump, c.i.f. Atlantic Seaboard (African)	$17.50
45 to 46% Cr_2O_3 (Turkish)	$16.00 to 16.50
48% Cr_2O_3 (African)	20.50
48% min. Cr_2O_3 (Turkish)	19.25
Chrome concentrate, 50% and over Cr_2O_3, c.i.f. Atlantic Seaboard	22.00
52% Cr_2O_3 (Turkish)	21.75
48 to 49% Cr_2O_3 (Turkish)	19.25

Fluorspar

Per Net Ton	
Domestic, washed gravel, 85-5, f.o.b. Kentucky, and Illinois mines for all-rail shipment	$14.00 to $15.00
Same grade for Ohio River barge shipment for Kentucky and Illinois River landings	14.00 to 15.00
No. 2 lump, 85-5, f.o.b. Kentucky and Illinois mines	14.00 to 15.00
Foreign, 85% calcium fluoride, not over 5% silicon, c.i.f. Atlantic ports, duty paid	18.50
Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silicon, f.o.b. Illinois and Kentucky mines	30.00

COKE, COAL AND FUEL OIL

Coke

	Per Net Ton
Furnace, f.o.b. Connellsville Prompt	$3.25 to $3.50
Foundry, f.o.b. Connellsville Prompt	4.00 to 5.10
Foundry, by-product, Chicago ovens, for delivery outside switching district	3.50
Foundry, by-product, delivered in Chicago switching district	9.25
Foundry, by-product, New England, delivered	11.00
Foundry, by-product, Newark or Jersey City, del'd	9.24 to 9.72
Foundry, by-product, Phila.	9.05
Foundry, by-product, Cleveland, delivered	9.35
Foundry, Birmingham	6.00
Foundry, by-product, St. Louis, f.o.b. ovens	8.00
Foundry, by-product, del'd St. Louis	9.00
Foundry, from Birmingham, f.o.b. cars docks, Pacific ports	14.75

Coal

Per Net Ton	
Mine run steam coal, f.o.b. W. Pa. mines	$1.45 to $1.65
Mine run coking coal, f.o.b. W. Pa.	1.75 to 1.95
Gas coal, ¾-in., f.o.b. Pa. mines	1.85 to 2.35
Mine run gas coal, f.o.b. Pa. mines	1.75 to 1.95
Steam slack, f.o.b. W. Pa. mines	1.00 to 1.25
Gas slack, f.o.b. W. Pa. mines	1.20 to 1.45

Fuel Oil

Per Gal. f.o.b. Bayonne, N. J.	
No. 3 distillate	4.25c.
No. 4 industrial	3.87½c.

Per Gal. f.o.b. Baltimore	
No. 3 distillate	4.25c.
No. 4 industrial	3.87½c

Per Gal. del'd Chicago	
No. 3 industrial fuel oil	4.75c.
No. 5 industrial fuel oil	3.75c.

Per Gal. f.o.b. Cleveland	
No. 3 distillate	5.25c.
No. 4 industrial	5.12½c.
No. 5 industrial	4.25c.

REFRACTORIES

Fire Clay Brick

	Per 1000 f.o.b. Works: High-heat Duty Brick	Intermediate Duty Brick
Pennsylvania	$45.00	$40.00
Maryland	50.00	40.00
New Jersey	50.00	43.00
Ohio	45.00	40.00
Kentucky	45.00	40.00
Missouri	45.00	40.00
Illinois	45.00	40.00
Ground fire clay, per ton	7.00	

Silica Brick

Per 1000 f.o.b. Works	
Pennsylvania	$45.00
Chicago District	54.00
Birmingham	55.00
Silica clay, per net ton	9.00

Chrome Brick

Per Net Ton	
Standard, f.o.b. Baltimore, Plymouth Meeting and Chester, Pa.	$45.00
Chemically bonded f.o.b. Baltimore, Plymouth Meeting and Chester, Pa.	45.00

Magnesite Brick

Per Net Ton	
Standard, f.o.b. Baltimore and Chester, Pa.	$65.00
Chemically Bonded, f.o.b. Baltimore	55.00

Grain Magnesite

Per Net Ton	
Imported f.o.b. Baltimore and Chester, Pa.	$45.00
Domestic, f.o.b. Baltimore and Chester	40.00
Domestic, f.o.b. Chewelah, Wash.	22.00

Warehouse Prices for Steel Products

PITTSBURGH

Base per Lb.

Plates	3.15c.
Structural shapes	3.15c.
Soft steel bars and small shapes	2.90c.
Reinforcing steel bars	2.90c.
Cold-finished and screw stock:	
Rounds and hexagons	3.20c.
Squares and flats	3.20c.
Hoops and bands under ¼ in.	3.20c.
Hot-rolled annealed sheets (No. 24), 25 or more bundles	3.30c.
Galv. sheets (No. 24), 25 or more bundles	3.95c.
Hot-rolled sheets (No. 10)	2.95c.
Galv. corrug. sheets (No. 28), per square (more than 3750 lb.)	$3.69
Spikes, large	2.90c.
Track bolts, all sizes, per 100 count, 65 per cent off list.	
Machine bolts, 100 count, 65 per cent off list.	
Carriage bolts, 100 count, 65 per cent off list.	
Nuts, all styles, 100 count, 65 per cent off list.	
Large rivets, base per 100 lb.	$3.50
Wire, black, soft ann'l'd, base per 100 lb.	*2.70
Wire, galv. soft, base per 100 lb.	*2.925
Common wire nails, per keg	*2.834
Coment coated nails, per keg	*2.834

On plates, structurals, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applies to orders of 400 to 9999 lbs.

*Delivered in Pittsburgh switching district.

CHICAGO

Base per Lb.

Plates and structural shapes	3.20c.
Soft steel bars	2.95c.
Cold-fin. steel bars:	
Rounds and hexagons	3.35c.
Flats and squares	3.35c.
Hot-rolled strip	3.30c.
Hot-rolled annealed sheets (No. 24)	3.85c.
Galv. sheets (No. 24)	4.55c.
Hot rolled sheets (No. 10)	3.05c.
Spikes (keg lots)	3.50c.
Track bolts (keg lots)	4.65c.
Rivets, structural (keg lots)	3.65c.
Rivets, boiler (keg lots)	3.75c.

Per Cent Off List

Machine bolts	*70
Carriage bolts	*70
Lag screws	*70
Hot-pressed nuts, sq. tap. or Hot-pressed nuts, sq. tap or blank	*70
Hot-pressed nuts, hxe. tap or Hot-pressed nuts, hex. tap or blank	*70
Hex. head cap screws	87½
Cut point set screws	80
Flat head bright wood screws	50 and 20
Spring cotters	55
Stove bolts in full packages	70
Rd. hd. tank rivets, 7/16 in. and smaller	57½
Wrought washers	$4.50 off list
Black ann'l'd wire per 100 lb.	$2.85
Com. wire nails, base per keg	2.95†
Cement c't'd nails, base per keg	2.95†

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 9999 lb. All prices are f.o.b. consumers' plants within the Chicago switching district.

*These are quotations delivered to city trade for quantities of 100 lb. or more. For lots of less than 100 lb., the quotation is 65 per cent off. Discounts applying to country trade are 70 per cent off, f.o.b., Chicago, with full or partial freight allowed up to 50c. per 100 lb.

†Prices for city and suburbs only.

NEW YORK

Base per Lb.

Plates, ¼ in. and heavier	3.40c.
Structural shapes	3.37c.
Soft steel bars, small shapes	3.26c.
Iron bars	3.26c.
Iron bars, swed. charcoal	6.50c.
Cold-fin. shafting and screw stock: Rounds and hexagons	3.81c.
Flats and squares	4.31c.
Cold-rolled strip, soft and quarter hard	3.36c.
Hoops	3.56c.
Bands	3.56c.
Hot-rolled sheet (No. 10)	3.31c.
Hot-rolled ann'l'd sheets (No. 24*)	3.89c.
Galvanized sheets (No. 24*)	4.50c.
Long terne sheets (No. 24)	5.20c.
Standard tool steel	11.00c.
Wire, black annealed (No. 10)	3.40c.
Wire, galv. (No. 10)	3.75c.
Tire steel, 1 x ½ in. and larger	3.65c.
Open hearth spring steel	4.00c. to 10.00c.
Common wire nails, base, per keg	$3.21

Machine bolts, cut thread:	Per Cent Off List
All diameters	65 and 10
Carriage bolts, cut thread:	
All diameters	65 and 10

Boiler tubes:	Per 100 Ft.
Lap welded, 2-in.	$18.05
Seamless welded, 2-in.	19.24
Charcoal iron, 2-in.	24.94
Charcoal iron 4-in.	63.65

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

ST. LOUIS

Base per Lb.

Plates and struc. shapes	3.45c.
Bars, soft steel or iron	3.20c.
Cold-fin. rounds, shafting, screw stocks	3.60c.
Hot-rolled annealed sheets (No. 24)	4.10c.
Galv. sheets (No. 24)	4.65c.
Hot-rolled sheets (No. 10)	3.30c.
Black corrug. sheets (No. 24)	4.10c.
*Galv. corrug. sheets	4.65c.
Structural rivets	4.00c.
Boiler rivets	4.10c.

Per Cent Off List

Tank rivets, 7/16 in. and smaller	55
Machine and carriage bolts, lag screws, fitting up bolts, bolt ends, plow bolts, hot-pressed nuts, square and hexagon, tapped or blank, semi-finished nuts: All quantities	70

*No. 26 and lighter take special prices.

PHILADELPHIA

Base per Lb.

*Plates, ¼-in. and heavier	2.98c.
*Structural shapes	2.98c.
*Soft steel bars, small shapes, iron bars (except bands)	2.93c.
‡Reinforc. steel bars, sq. twisted and deformed	2.96c.
Cold-finished steel bars	3.61c.
*Steel hoops	3.43c.
*Steel bands, No. 12 and 3/16 in. incl.	3.18c.
Spring steel	5.00c.
†Hot-rolled anneal. sheets (No. 24)	3.65c.
†Galvanized sheets (No. 24)	4.30c.
*Hot-rolled annealed sheets (No. 10)	3.08c.
Diam. pat. floor plates, ¼ in.	4.95c.
Swedish iron bars	6.25c.

These prices are subject to quantity differentials except on reinforcing and Swedish iron bars.

*Base prices subject to deduction on orders aggregating 4000 lb. or over.

†For 50 bundles or over.

‡For less than 2000 lb.

CLEVELAND

Base per Lb.

Plates and struc. shapes	3.31c.
Soft steel bars	2.95c.
Reinforc. steel bars	2.10c.
Cold-finished steel bars	3.25c.
Flat-rolled steel under ¼ in.	3.36c.
Cold-finished strip	†3.00c.
Hot-rolled annealed sheets (No. 24)	3.96c.
Galvanized sheets (No. 24)	4.61c.
Hot-rolled sheets (No. 10)	3.11c.
Hot-rolled 3/16 in. 24 to 48 in. wide sheets	3.56c.
Black ann'l'd wire, per 100 lb.	$2.65
No. 9 galv. wire, per 100 lb.	3.90
Com. wire nails, base per keg	2.40

†Outside delivery 10c. less.

CINCINNATI

Base per Lb.

Plates and struc. shapes	3.42c.
Bars, soft steel or iron	3.17c.
New billet reinforc. bars	3.25c.
Rail steel reinforc. bars	3.25c.
Hoops and bands, 3/16 in. and lighter	3.47c.
Cold-finished bars	3.57c.
Hot-rolled annealed sheets (No. 24)	4.02c.
Galv. sheets (No. 24)	4.72c.
Hot-rolled sheets (No. 10)	3.22c.
Structural rivets	4.35c.
Small rivets	55 per cent off list
No. 9 ann'l'd wire, per 100 lb. (1000 lb. or over)	$2.88
Com. wire nails, base per keg: Any quantity less than carload	3.04
Cement c't'd nails, base 100-lb. keg	3.50
Chain, 1-in. per 100 lb.	8.35

Net per 100 Ft.

Seamless steel boiler tubes, 2-in.	$22.66
4-in.	48.14
Lap-welded steel boiler tubes, 2-in.	19.35
4-in.	45.30

BUFFALO

Base per Lb.

Plates	3.38c.
Struc. shapes	3.25c.
Soft. steel bars	3.00c.
Reinforcing bars	2.60c.
Cold-fin. flats and sq.	3.40c.
Round and hex.	3.40c.
Cold-rolled strip steel	3.19c.
Hot-rolled annealed sheets (No. 24)	4.06c.
Heavy hot-rolled sheets, 3/16 in., 24 to 48 in. wide	3.63c.
Galv. sheets (No. 24)	4.70c.
Bands	3.43c.
Hoops	3.43c.
Heavy hot-rolled sheets	3.18c.
Com. wire nails, base per keg	$3.35
Black wire, base per 100 lb. (2500-lb. lots or under)	3.55
(Over 2500 lb.)	3.45

BOSTON

Base per Lb.

Beams, channels, angles, tees, zees	3.54c.
H beams and shapes	3.51c.
Plates—sheered, tank and univ. mill, ¼ in. thick and heavier	3.56c.
Floor plates, diamond pattern	5.36c.
Bar and bar shapes (mild steel)	3.35c.
Bands 3/16 in. thick and No. 12 ga. incl.	3.65c. to 4.65c.
Half rounds, half ovals, ovals and bevels	4.60c.
Tire steel	4.60c.
Cold-rolled strip steel	3.245c.
Cold-finished rounds, squares and hexagons	3.90c.
Cold-finished flats	3.75c.
Blue annealed sheets, No. 10 ga.	3.65c.
One pass cold-rolled sheets No. 24 ga.	4.20c.
Galvanized steel sheets, No. 24 ga.	4.90c.
Lead coated sheets, No. 24 ga.	5.85c.

Prices delivered by truck in metropolitan Boston subject to quantity differentials.

DETROIT

Base per Lb.

Soft and bars	3.04c.
Structural shapes	3.42c.
Plates	3.42c.
Floor plates	5.17c.
Hot-rolled annealed sheets (No. 24)	3.94c.
Hot-rolled sheets (No. 10)	3.14c.
Galvanized sheets (No. 24)	4.72c.
Bands	3.39c.
Hoops	3.39c.
Cold-finished bars	3.49c.
Cold-rolled strip	3.18c.
Hot-rolled alloy steel (S.A.E. 3100 Series)	5.29c.*
Bolts and nuts	70 and 5 per cent off list

Prices delivered by truck in metropolitan Detroit, subject to quantity differentials.

*Price applies to 1,000 lb. and over.

MILWAUKEE

Base per Lb.

Plates and structural shapes	3.31c.
Soft steel bars	3.06c.
Hot-rolled strip	3.41c.
Hot-rolled sheets (No. 10)	3.16c.
Hot-rolled annealed sheets (No. 24)	3.96c.
Galvanized sheets (No. 24)	4.66c.
Cold-finished steel bars	3.46c.
Cold-rolled strip	3.33c.
Structural rivets (keg lots)	3.86c.
Boiler rivets (keg lots)	3.96c.
Track spikes (keg lots)	3.71c.
Track bolts (keg lots)	4.86c.
Black annealed wire	3.10c.
Com. wire nails	2.90c.
Cement coated nails	2.90c.

Per Cent Off List

Machine bolts	70 and 10
Carriage bolts	70 and 10
Hot-pressed nuts, sq. and hex. tapped or blank (keg lots)	70 and 10

Prices given above are delivered Milwaukee.

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 9999 lb. On galvanized and No. 24 hot-rolled annealed sheets the prices given apply on orders of 400 to 1500 lb. On cold-finished bars the prices are for orders of 1000 lb. or more of a size.

ST. PAUL

Base per Lb.

Mild steel bars	3.20c.
Structural shapes	3.45c.
Plates	3.45c.
Cold-finished bars	3.37c.
Bands and hoops	3.55c.
Hot-rolled annealed sheets, No. 24	3.90c.
Galvanized sheets, No. 24	4.50c.
Cold-rolled sheets, No. 20	4.95c.

On mild steel bars, shapes, plates and hoops and bands the base applies on 400 to 14,999 lb. On cold-finished bars, hot-rolled sheets, galvanized sheets and cold-rolled sheets base applies on 15,000 lb. and over.

BALTIMORE

Base per Lb.

*Mild steel bars	2.95c.
*Iron bars	2.95c.
*Reinforcing bars	2.95c.
*Structural shapes	3.00c.
*Plates	3.00c.
†Hot-rolled sheet, No. 10	3.10c.
‡Hot-rolled annealed sheets, No. 24	3.60c.
‡Galvanized sheets, No. 24	4.30c.
*Bands	3.20c.
*Hoops	3.45c.
§Cold-rolled rounds	3.58c.
§Cold-rolled squares, hex. and flats	3.58c.
Rivets	4.40c.
Bolts and nuts, per cent off list	60 and 10

*Quantity extras per size apply. †Quantity extras per thickness apply. Hot-rolled quantity extras are: 2000 lb. and over, base; 1500 lb. to 1999 lb., add 15c. per 100 lb.; 1000 lb. to 1499 lb., add 30c.; 0 to 999 lb., add 50c.

‡50 bundles and over, base. For 1 to 9 bundles add 50c. per 100 lb.; for 10 to 49 bundles add 25c.

§Base for 1000 lb. and over. For 500 to 999 lb. add 25c. per 100 lb.; for 300 to 499 lb. add 75c.; for 0 to 299 lb. add $1.25.

CHATTANOOGA

Base per Lb.

Mild steel bars	3.31c.
Iron bars	3.31c.
Reinforcing bars	3.31c.
Structural shapes	3.56c.
Plates	3.56c.
Hot-rolled sheets, No. 10	3.56c.
Hot-rolled annealed sheets, No. 24	4.21c.
Galvanized sheets, No. 24	4.86c.
Steel bands	3.61c.
Cold-finished bars	3.98c.

MEMPHIS

Base per Lb.

Mild steel bars	3.42c.
Shapes, bar size	3.42c.
Iron bars	3.42c.
Structural shapes	3.67c.
Plates	3.67c.
Hot-rolled sheets, No. 10	3.47c.
Hot-rolled annealed sheets, No. 24	4.27c.
Galvanized sheets, No. 24	4.97c.
Steel bands	3.72c.
Cold-drawn rounds	3.89c.
Cold-drawn flats, squares, hexagons	5.89c.
Structural rivets	4.25c.
Bolts and nuts, per cent off list	65
Small rivets, per cent off list	50

NEW ORLEANS

Base per Lb.

Mild steel bars	3.30c.
Reinforcing bars	3.50c.
Structural shapes	3.55c.
Plates	3.55c.
Hot-rolled sheets, No. 10	3.55c.
Hot-rolled annealed sheets, No. 24	4.50c.
Galvanized sheets, No. 24	4.95c.
Steel bands	3.95c.
Cold-finished steel bars	4.15c.
Structural rivets	4.25c.
Boiler rivets	4.25c.
Common wire nails, base per keg	$3.10
Bolts and nuts, per cent off list	70

PACIFIC COAST

Base per Lb.

	San Francisco	Los Angeles	Seattle
Plates, tank and U. M.	3.55c.	3.60c.	3.55c.
Shapes, standard	3.55c.	3.60c.	3.55c.
Soft steel bars	3.60c.	3.60c.	3.60c.
Reinforcing bars, f.o.b cars dock Pacific ports	2.45c.	2.45c.	2.45c.
Hot-rolled annealed sheets (No. 24)	4.40c.	4.35c.	4.40c.
Hot-rolled sheets (No. 10)	3.75c.	3.70c.	3.75c.
Galv. sheets (No. 24)	5.00c.	4.95c.	5.00c.
Cold finished steel: Rounds	5.95c.	5.85c.	6.00c.
Squares and hexagons	7.20c.	7.10c.	7.25c.
Flats	7.70c.	7.60c.	8.25c.
Common wire nails —base per keg less carload	$3.30	$3.40	$3.30

All items subject to differentials for quantity.

TOOL STEEL

Prices are same for warehouse distribution at all points on or East of Mississippi River. West of Mississippi quotations are 1c. a lb. higher.

Base per Lb.

High speed	57c.
High carbon chrome	37c.
Oil hardening	22c.
Extra	17c.
Regular	14c.

Tin Declines 3c., But Consumers Make No Move to Buy

Copper Sales Average 1000 Tons Daily; Price Is Steady Here But Advances Abroad—Spelter Sales for the Week Total 1700 Tons

NEW YORK, Aug. 13.—Most market operators consider copper stocks more than ample for all domestic needs, and are of the opinion that the heavy deliveries of the past month do not represent a corresponding lift in actual consumption. However, even though the market may have been somewhat overbought last month, the average of 1000 tons of new business which has come into the market each day during the current month has given this metal plenty of support. Prices continue very firm, with no "outside" metal available at a price lower than 8c. a lb., Connecticut valley. There is little likelihood of much change in the electrolytic copper situation over the balance of the month. Fabricators are well covered into September, and prices are stable enough to discourage any coverage for periods further forward.

Foreign demand continues in moderate volume, and the price abroad has scored a slight advance above the position a week ago. A fair amount of metal changed hands this morning at 7.85c. to 7.90c. a lb., c.i.f. usual Continental base ports.

The Week's Prices. Cents Per Pound for Early Delivery

	Aug. 7	Aug. 8	Aug. 9	Aug. 10	Aug. 12	Aug. 13
Electrolytic copper, N. Y.*	7.75	7.75	7.75	7.75	7.75	7.75
Lake copper, N. Y.	8.12½	8.12½	8.12½	8.12½	8.12½	8.12½
Straits tin, spot, New York	52.37½	52.15	51.70	....	50.50	49.62½
Zinc, East St. Louis	4.50	4.50	4.50	4.50	4.50	4.50
Zinc, New York†	4.87½	4.87½	4.87½	4.87½	4.87½	4.87½
Lead, St. Louis	4.05	4.05	4.05	4.05	4.05	4.05
Lead, New York	4.20	4.20	4.20	4.20	4.20	4.20

*Refinery quotations; price ¼c. higher delivered in Connecticut.
†Includes emergency freight charge.

Aluminum, virgin 99 per cent plus, 19c. to 21c. a lb., delivered.
Aluminum, No. 12 remelt, No. 2 standard, in carloads, 16.25c. a lb., delivered.
Nickel, electrolytic, 35c. to 36c. a lb. base refinery, in lots of 2 tons or more.
Antimony, Asiatic, 13c. a lb., New York.
Brass ingots, commercial 85-5-5-5, 8c. a lb., delivered; in Middle West ¼c. a lb. is added on orders for less than 40,000 lb.

From New York Warehouse
Delivered Prices, Base per Lb.

Tin, Straits pig	50.75c. to 51.75c.
Tin, bar	52.75c. to 53.75c.
Copper, Lake	9.00c. to 10.00c.
Copper, electrolytic	9.00c. to 9.50c.
Copper, castings	8.75c. to 9.75c.
*Copper sheets, hot-rolled	15.00c.
*High brass sheets	13.62½c.
*Seamless brass tubes	15.37½c.
*Seamless copper tubes	15.25c.
*Brass rods	12.12½c.
Zinc, slabs	5.75c. to 6.75c.
Zinc, sheets (No. 9), casks, 1200 lb. and over	10.25c.
Lead, American pig	4.62½c. to 5.62½c.
Lead, bar	5.62½c. to 6.62½c.
Lead, sheets	7.75c.
Antimony, Asiatic	13.50c. to 14.50c.
Alum., virgin, 99 per cent, plus	23.30c.
Alum., No. 1 for remelting, 98 to 99 per cent	18.00c. to 19.00c.
Solder, ½ and ½	29.50c. to 30.50c.
Babbitt metal, commercial grades	25.00c. to 60.00c.

*These prices are also for delivery from Chicago and Cleveland warehouses.

From Cleveland Warehouse
Delivered Prices per Lb.

Tin, Straits pig	55.00c.
Tin, bar	57.00c.
Copper, Lake	9.00c.
Copper, electrolytic	9.00c.
Copper, castings	8.25c.
Zinc, slabs	6.00c. to 6.25c.
Lead, American pig	4.80c. to 5.15c.
Lead, bar	5.00c.
Antimony, Asiatic	15.00c.
Babbitt metal, medium grade	19.25c.
Babbitt metal, high grade	59.00c.
Solder, ½ and ½	32.25c.

Old Metals, Per Lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators, and selling prices are those charged to consumers after the metal has been prepared for their uses. (All prices are nominal.)

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	5.75c.	6.50c.
Copper, hvy. and wire	5.62½c.	6.12½c.
Copper, light and bottoms	4.62½c.	5.12½c.
Brass, heavy	3.00c.	3.62½c.
Brass, light	2.25c.	3.00c.
Hvy. machine composition	4.87½c.	5.37½c.
No. 1 yel. brass turnings	4.00c.	4.50c.
No. 1 red brass or compos. turnings	4.37½c.	4.87½c.
Lead, heavy	3.00c.	3.37½c.
Zinc	2.25c.	2.62½c.
Cast aluminum	10.62½c.	11.75c.
Sheet aluminum	12.00c.	13.50c.

Zinc

Sales of zinc last week amounted to 1700 tons, practically all at 4.50c. a lb. for immediate shipment, as compared with 7000 tons booked in the preceding week. Undelivered orders were reduced about 3000 tons to 36,000 tons during the week. The current market is, naturally enough, quiet following these two heavy weeks. Nevertheless prices are firmly established at 4.50c. a lb., East St. Louis, and 4.87½c., New York. Total stocks of Prime Western metal held by all producers were reduced over 3000 tons during July and stood at 93,483 tons at the end of the month. Producers of concentrates in the Tri-State area are offering supplies freely at $29 and $30 a ton for flotation and prime grades respectively. Sales of 7800 tons of concentrates during the week exceeded production by about 100 tons. Shipments totaled about 7700 tons, and stocks now stand at about 24,300 tons.

Tin

The International Tin Committee at its recent meeting in Paris announced a 15 per cent increase in production quotas. This action has served to depress prices here and abroad, but buyers have been hesitant about placing forward commitments even though quotations are lower than they have been for some time. The only demand in the market is for spot metal in small quantities from consumers who habitually purchase only immediate requirements. Straits tin was available this morning at New York at 49.62½c. a lb., almost 3c. under the level of a week ago. In London, spot and future standard on first call today were £219 and £209 5s. respectively, and Straits at Singapore was posted at £218 2s. 6d.

Lead

Current sales are of the carlot variety, typical of a quiet market which usually follows a period of exceptional activity. Prices are firm and unchanged at 4.05c. and 4.20c. a lb., for St. Louis and New York delivery respectively. There is little likelihood that these quotations will be revised upward in the near future unless some development forces in heavy demands for September and October metal. At present the former month is only about 40 per cent covered and the latter month is practically untouched. The Joplin ore market is steady at an average price of $41.75 a ton. Shipments during the week totaled 1000 tons, production was about 750 tons, and stocks now stand at about 16,650 tons.

Fabricated Structural Steel

Awards Decline Slightly—New Projects Higher

STRUCTURAL steel lettings of 15,920 tons compare with 21,450 tons last week. The largest bookings include 3655 tons for a post office at San Antonio, Tex., 2700 tons for a lock and dam in West Virginia and 1160 tons for a building for the Washburn Wire Co. in New York. New projects of 14,780 tons compare with 10,300 tons last week and 22,600 tons two weeks ago. The outstanding new job reported is 7200 tons for the Homestead-Pittsburgh high level bridge. Other large projects include 2100 tons for a dam at Dresbach, Minn., and 1470 tons for a conduit in Nebraska. Plate inquiries total 6155 tons, including 2100 tons for a water pipe line in Ohio and 2800 tons for a pipe line in California. Sheet steel piling awards call for 2900 tons. Structural steel bookings for the week follow:

STRUCTURAL STEEL AWARDS

NORTH ATLANTIC STATES

Somerville, Mass., 130 tons, post office, to Boston Bridge Works, Inc.

Burlington, Vt., 130 tons, Southwick Memorial, to Vermont Structural Steel Corpn.

Middlebury, Vt., 130 tons, college dormitory, to Bethlehem Contracting Co.

New York, 1160 tons, building for Washburn Wire Co., to McClintic-Marshall Corpn.

Staten Island, N. Y., 1125 tons, Tottenville High School, to Bethlehem Fabricators, Inc.

Flushing, L. I., 120 tons, Queens County Savings Bank, to Nassau Iron Works, for Joseph T. Ryerson & Son Co., Inc., fabricator.

New York, 205 tons, market buildings at 111 Street and Park Avenue, to Weatherly Steel Co.

Pittsburgh, 360 tons, alterations to Knoxville Jr. High School, to Keystone Engineering Co.

CENTRAL STATES

Springfield, Ill., 155 tons, floors, International Harvester Co. building, to Burger Iron Co.

Chicago, 170 tons, addition to building of E. P. Strandberg Co., to Wendnagel & Co.

Detroit, 250 tons, addition to plant of Detroit Steel Corpn., to Whitehead & Kales Co.

East Chicago, Ind., 650 tons, addition to plant of General American Tank Car Corpn., to unnamed bidder.

Flackville, Ind., 390 tons, State highway bridge, to McClintic-Marshall Corpn.

Des Moines, Iowa, 240 tons, warehouse for General Motors Corpn., to Pittsburgh-Des Moines Steel Co.

Osborne County, Kan., 205 tons, bridge project 8-19-W573, to Kansas City Structural Steel Co.

Gasconade, Mo., 210 tons, Missouri Pacific Railroad Co., 146 ft. truss span, to Virginia Bridge & Iron Co., Inc.

SOUTH AND SOUTHWEST

Red House, W. Va., 2700 tons, lock and dam No. 1, United States Engineer Office, Pittsburgh, to Dravo Contracting Co.

Wellsburg, W. Va., 170 tons, State highway bridge, to Pittsburgh-Des Moines Steel Co.

Chattanooga, Tenn., 640 tons, TVA project No. 52321, Wheeler power plant, to Wisconsin Bridge Co.

San Antonio, Texas, 3655 tons, post office, to McClintic-Marshall Corpn.

Wickenburg, Ariz., 200 tons, bridge, to Pacific Coast Steel Corpn.

Maricopa County, Ariz., 300 tons, State bridge, to Pacific Coast Steel Corpn.

Yuma, Ariz., 470 tons, roller gates, Bureau of Reclamation, to Dravo Contracting Co.

WESTERN STATES

McCall, Idaho, 275 tons, bridge, to Virginia Bridge & Iron Co., Inc.

San Francisco, 120 tons, building for du Pont, to McClintic-Marshall Corpn.

San Francisco, 1000 tons, United States mint, to Pacific Coast Steel Corpn.

San Pedro, Cal., 360 tons, post office, to Pacific Coast Steel Corpn.

Grand Coulee, Wash., 400 tons, silo, to Pittsburgh-Des Moines Steel Co.

NEW STRUCTURAL STEEL PROJECTS

NORTH ATLANTIC STATES

Camden, N. J., 1000 tons, three storage tanks for South Jersey Port Commission; bids on Sept. 11.

Buffalo, 100 tons, Tonawanda Harbor and Black Rock ship canal job by the War Department.

Dunkirk, N. Y., 100 tons, St. Joseph's Academy, Meister Contracting Co., Dunkirk, low general bidder.

Pittsburgh, 7200 tons, Homestead-Pittsburgh high level bridge, bids to be taken by Allegheny County Authority.

SOUTH AND SOUTHWEST

Newport, Ky., 500 tons, factory.

Fort Knox, Ky., 250 tons, United States depository.

State of Alabama, 300 tons, bridge.

Guadalupe County, Ariz., 184 tons, two State bridges, bids opened.

CENTRAL STATES

Massillon, Ohio, 100 tons, addition to State hospital.

Warren, Ohio, 175 tons, post office.

Rutledge Siding, Wis., 340 tons, Government highway bridge.

Nebraska, 360 tons, beam bridges in Nebraska for Chicago, Burlington & Quincy.

Dresbach, Minn., 2100 tons, dam No. 7, Warner Brothers Construction Co., Chicago, low on general contract.

North Platte, Neb., 1470 tons, conduit.

Dubuque, Iowa, 400 tons, bridge.

WESTERN STATES

State of Wyoming, 202 tons, bridges in four counties, bids Aug. 20.

Boulder City, Nev., 635 tons, transmission towers at Boulder dam, American Bridge Co., low on delivered price.

FABRICATED PLATES

AWARDS

Oakland, Cal., 160 tons, material for Broadway Low Level tunnel, to Berkeley Steel Construction Co.

NEW PROJECTS

Philadelphia, 1000 tons, ferryboat for Virginia Ferry Corpn., general contract awarded to Sun Shipbuilding & Drydock Co. This material will be bought in about two weeks.

Elyria, Ohio, 2100 tons, 1400 tons for four miles of 30-in. welded steel water pipe and 700 tons for a 2,000,000-gal. tank. Inquiry expected this week.

La Mesa, Cal., 2800 tons, eight miles of 36 and 48-in. pipeline between El Capitan and El Monte pumping plants, to be constructed by City of San Diego and La Mesa Lemon Grove & Spring Valley Irrigation District, bids soon.

Price, Utah, 258 tons, 14 and 18-in. steel pipe for water system, bids Aug. 16.

SHEET PILING

AWARDS

Red Wing, Minn., 1400 tons, lock No. 3, to Illinois Steel Co.

New Boston, Ill., 1400 tons, lock No. 17, to Bethlehem Steel Co.

Seattle, Wash., 100 tons sheet piling, bridges in Alaska for Department of Interior, to Duffin Iron Works.

NEW PROJECTS

Huron, Ohio, 140 tons, addition to Wheeling & Lake Erie docks.

Reinforcing Steel

Awards 1,475 Tons—New Projects 2,075 Tons

LeClaire, Iowa, 550 tons, lock on Mississippi River to Inland Steel Co.

Red Wing, Minn., lock No. 3 to Paper-Calmenson Co.

New Boston, Ill., 600 tons, lock No. 17 to Bethlehem Steel Co.

Boston, 100 tons, Robert Gould Shaw school repairs.

Boston, 100 tons, Washington Irving school repairs.

Buffalo, 150 tons; Tonawanda Harbor and Black Rock ship canal job by the War Department.

Albany, N. Y., unstated tonnage, state highway work; bids on Sept. 13.

New York, 300 tons, first section of Sixth Avenue subway; bids in September.

Beach City and Mills Creek, Ohio, 325 tons, for relocating Pennsylvania, Baltimore & Ohio and Wheeling & Lake Erie tracks in the Muskingum conservancy district, to the Kalman Steel Corpn.

Reading, Pa., 750 tons, reservoir; bids Aug. 21.

State of Wyoming, 133 tons, bridges in four counties; bids Aug. 20.

Guadalupe, Ariz., 117 tons, two State bridges; bids opened.

San Pedro, Cal., 428 tons, post office; general contract awarded.

Cleveland-Lorain Output Unchanged at 50 Per Cent

Rise in Bookings Has Been Checked—Method of Quoting Wire Products To Be Revised—Scrap Advances

CLEVELAND, Aug. 13.—With the ingot output in the Cleveland-Lorain territory unchanged this week at 50 per cent of capacity, the gain shown weekly since early in June appears to have been checked. New demand for finished steel in most forms is being maintained at recent levels, although there is a lull in round-lot buying of sheets by the automotive industry and some makers will need additional orders to maintain present good finishing mill operations after this week.

Sheets are moving in satisfactory volume to miscellaneous consumers. Makers of washing machine tubs and steel barrels have placed sizable lots after a considerable period of inactivity. Orders for strip steel from automobile parts makers have taken an upturn. Merchant bars are moving well to agricultural implement and to machinery manufacturers and also to miscellaneous consumers. Orders for heavy rolled steel products so far in August are equal to or slightly better than during the corresponding period of July. In the construction field some new public work has come out, but private work is light. United States engineers have asked for bids for replacing gas lines of the East Ohio Gas Co. in the Muskingum Conservancy District, requiring 1700 tons of steel pipe.

Important revisions in the method of quoting wire product prices will be announced shortly and will greatly simplify the present price structure. While all the details have not been worked out, the plan provides for the adoption of a base carload price for all buyers with various quantity differentials for smaller lots, thus eliminating the present 20c. per 100-lb. deduction to jobbers.

Cases of price irregularities on sheets by overgrading are reported, and there are weak spots in the reinforcing bar market.

Scrap prices have again advanced.

Pig Iron

Shipments are keeping ahead of July and sales are about in the same volume as last month. Business is confined to small lots. A Lake furnace interest sold 5000 tons during the week. There is an active demand from makers of heating and plumbing equipment, machinery builders and manufacturers of agricultural implements, but not much new business from automotive foundries. While some of the malleable foundries are busy, jobbing shops that specialize on malleable castings for the automotive trade are rather quiet at present.

Foundry coke shipments are 25 per cent higher this month than in July.

Sheets

New business in sizeable lots came out during the week from manufacturers of washing machine tubs and steel barrels, from whom orders have been scarce for some time. Miscellaneous orders are good. New business from automotive sources is rather light following the recent activity which enabled some of the mills to accumulate a fair tonnage. The local sheet mills are operating at near capacity this week. While some mills are endeavoring to confine the waiving of drawing extras to the automotive industry, other larger consumers are insisting on the same concession. The waiving of the extra is not of benefit to jobbing stamping plants making automobile parts, as they are passing along to their consumers the saving in price of sheets. Over grading of sheets, which has developed in spots, is another factor that is somewhat disturbing prices.

Strip Steel

Orders for sizeable lots were placed during the week by General Motors parts units, for deliveries extending through September. Some new business has come from stamping plants making automobile radiator grilles. Demand for hot strip from agricultural implement manufacturers has improved. The local wide hot and cold-rolled strip mills are operating at capacity this week, and the narrow strip mill, at 60 per cent of capacity.

Iron Ore

Receipts of Lake Superior ore at Lake Erie ports during July were 3,295,198 tons, a gain of 293,463 tons over June. During the same month last year receipts were 3,362,090 tons. Receipts at these

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ports for the season were 8,524,165 tons, as against 7,947,330 tons in July last year. Shipments until Aug. 1 were 6,670,614 tons, as compared with 6,332,537 tons during the same period last year. Receipts at other than Lake Erie ports until Aug. 1 were 3,454,512 tons. During the same period last year receipts at these ports were 2,924,132 tons. The dock balance at Lake Erie ports Aug. 1 was 4,282,019 tons, as against 4,499,858 tons on the same date a year ago.

Bars, Plates and Shapes

Demand for bars is fairly good, the recent improvement in orders from miscellaneous sources having to a considerable extent filled the gap caused by a decline of business from the automotive industry. Demand for structural steel has improved following the placing of small orders by fabricators for recently awarded construction jobs. A State hospital addition in Massillon will require 100 tons of structural shapes. Inquiry for the Elyria waterworks extensions is expected out this week. These will require approximately 2100 tons of plates for a welded steel pipe line and elevated tank.

Reinforcing Bars

Three awards involving 325 tons for relocating railroad tracks at Beach City and Mills Creek, Ohio, in connection with the Muskingum Conservancy project have been made to the Kalman Steel Corpn. About 1500 tons remains to be placed by contractors for various projects in this development. Bids for 1100 tons for the Outhwaite housing project, Cleveland, have been rejected and new bids will be taken Aug. 29, and similar delay is expected on the Whiskey Island housing project, requiring about the same tonnage. The postponement is due to possible changes in Federal regulations respecting wage rates. Price irregularities are reported in spots, particularly on rail steel bars.

Scrap

Prices have again moved upward and the market is very firm. Advances of 50c. a ton or more on open-hearth grades and 25c. a ton on blast furnace scrap have been made. A Valley district mill is reported to have paid $14 for No. 1 heavy melting steel, and this grade sold by the Erie and New York Central railroads during the week brought $14 and $13.75 respectively. Dealers are paying $12 in Cleveland for No. 1 heavy melting steel for Lorain delivery. Machine shop turnings are bringing $7.50 from dealers for Youngstown delivery.

THE Cleveland Stock Exchange has approved the listing of 120,000 shares of no par common stock of the Monarch Machine Tool Co., Sidney, Ohio, maker of engine, tool room, automatic and manufacturing lathes and allied products. Company has 125,000 shares of common authorized but has no bonds or preferred stock. Dividends have been paid the past three years at the rate of 10c. a share in 1932, 10c. in 1933 and 30c. in 1934.

Scrap Stronger At Boston

BOSTON, Aug. 13.—Although less active, No. 1 heavy melting steel, scrap rails and No. 2 steel for Pittsburgh delivery are 50c. a ton higher, and the market for steel turnings and long-bundled skeleton is firmer. About the only material moving to eastern Pennsylvania is breakable cast. No. 2 steel for export appears pegged at $7.75 a ton delivered local Army base, no $8 sales being reported the past week. Most recent sales of No. 1 steel and scrap rails have been at $8.75 a ton delivered Army base, but some business was put through at $9. Exporters are stocking material at the Army base and at Providence, R. I. A boat will start loading here for Italy, and one at Providence, the last of this month. A Rhode Island mill is offering $8.50 a ton delivered for No. 1 steel, but obtaining little, while the American Steel & Wire Co., Worcester, Mass., is paying $9 a ton delivered for No. 1, and $8 for No. 2 steel. The movement of chemical borings is almost exclusively to gas companies.

Pig iron buying for prompt and nearby delivery is a little better, but not large, and is about equally divided between domestic and foreign brands. The outstanding feature in the situation, however, is the pickup in interest shown by melters. It now seems reasonably certain that pig iron buying will increase noticeably when fourth quarter books are opened. The high spot in activity at the moment is the machine tool industry.

Warehouses have revised size extras on 1 9/16 to 4-in. rounds and squares, and on flats over 1 in. following elimination by the mills of the 25c. extra on forging quality steel. Otherwise warehouse prices have not changed. The movement of steel and allied products out of warehouse has varied little the past few months, being moderately good in volume.

Detroit Scrap Mart Quiets Down

DETROIT, Aug. 13.—The local scrap market has quieted down after several weeks of steadily rising prices and little change is anticipated the remainder of this month. Machinery cast, automotive cast and stove plate are up 25c. a ton but other items are unchanged. The amount of scrap being produced by motor car companies this month is less than anticipated.

Eastern Pennsylvania Rate Up Six Points to 34 Per Cent

Buying Eases Off—Price Changes are Announced — Foreign Scrap Buyers Again Interested as Baltimore Brokers Break up Ships

PHILADELPHIA, Aug. 13. — Practically all sellers report a slight falling off of demand, although this is generally considered a temporary condition. A moderate volume of merchant wire tonnage is being forced in by impending price changes and, likewise, several users of forging billets are stocking up to avoid a fourth quarter rise in prices. The revision of bar extras announced last week is still driving in some orders from jobbers.

Virtually every mill in this area has increased its melting activity during the past week. It should be pointed out, however, that a portion of this increase in activity is temporary and not warranted by current sales. A number of furnaces have been placed in operation to take the place of older units which will soon be closed down for repairs. This overlapping period may last for about two weeks. However, for the current week the district activity is approximately six points higher at 34 per cent of capacity.

All sellers of forging quality carbon steel billets will advance quotations to $35 a ton, effective Aug. 20. Sizes under 5 by 5-in. down to 4 by 4-in., which heretofore sold as forging quality billets, will now be classified as bars and sold at bar prices subject to bar card extras.

It is probable that prices on merchant wire products will be revised in the near future. It is also reported that jobbers will be reclassified and receive preferential reductions from the base price depending on their size and status.

Bolts and nuts are weak in this area, and have been offered at considerably below the usual price of 70-10-5 per cent off base. Sales at concessions, however, have not been heavy. Rivets are steady but in negligible demand.

Pig Iron

Current shipments are well above the volume of a month ago. Most consumers are more willing to order forward requirements, but the bulk of day-to-day business continues to be made up of orders specifying immediate shipment. There have been instances of both Dutch and Russian iron being offered at prices at least $2 a ton under those quoted for domestic brands. Alan Wood has reopened its Scrub Oaks mine at Dover, N. J., and expects to average about 1000 tons of concentrates per day over the next few months.

Sheets and Strip

There are persistent reports that full-finished sheets are being sold in this area on a Detroit price basis. However, there is no known instance of such a transaction, although there is insistent agitation for all mills to afford local auto-body fabricating plants the same prices as their competitors in Detroit secure. A fair volume of steel has already been ordered in preparation for fall automobile production. One auto-body fabricator has ordered some steel for Studebaker and Plymouth bodies, and another stamping plant was recently in the market for steel for International Harvester trucks, Chevrolet and Chrysler bodies. There also have been purchases of stainless steel to be fabricated into parts for Navy vessels. American Sheet & Tin Plate Co. will supply 250 tons for Pennsylvania license plates.

Bars, Plates and Shapes

In about a month, Sun Shipbuilding & Drydock Corpn. will purchase over 1000 tons of steel for a ferryboat for a Pennsylvania Railroad subsidiary. Parish Pressed Steel Co. is buying supplies for converting 100 Reading box cars into automobile cars. South Jersey Port Commission, Camden, N. J., is asking for bids on Sept. 11 for about 1000 tons for three storage warehouses. Also general contractors for the Atlantic City and Wilmington post offices have been announced, and about 2000 tons of shapes and 300 tons of reinforcing will shortly be purchased for these projects. A reservoir at Reading, Pa., requiring 750 tons of bars, will be bid in on Aug. 21.

Scrap

A large source of scrap has been opened up in the East, both for domestic and foreign shipment. Boston Iron & Metal Co., Baltimore, will break up about 85 Shipping Board boats before the end of 1937, thus releasing about 200,000 tons of ferrous metal. These boats were originally purchased in November, 1932, but after about 15 of the original 100 boats had been

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scrapped the Government temporarily stopped the work. The logical consumer of this scrap would be Bethlehem's Sparrows Point plant, but this company has not yet been willing to meet the bids of foreign melters. Morris Shapiro has already sold 10,000 tons for European delivery, and a number of attractive bids have been received from the Japanese.

For the first six months of 1935 Philadelphia was third in volume of export scrap shipments, with loadings of 83,194 tons. New York was the first port, and Galveston, Tex., was the second. Total United States shipments abroad equaled 1,154,226 tons, of which Japan took 724,246 tons.

The scrap market here has lost none of its strength. Brokers are freely paying $11 for No. 1 steel for coverage on their recent 7000-ton sale to Worth Steel Co. Pencoyd is offering $10.25 for No. 2 steel in the immediate Philadelphia area and is bettering this offer in outlying districts. Bethlehem is now willing to pay $10.50 for No. 1 at Baltimore for Sparrows Point, Md., delivery. Philadelphia brokers report mill demands for No. 1 steel at $11, but are, naturally enough, refusing orders at this level inasmuch as they are paying the same price for their current supplies.

Imports

The following iron and steel imports were received here last week: 8300 tons of chrome ore from French Oceania; 2059 tons of pig iron from British India, and 101 tons of sponge iron, 79 tons of steel tubes, 28 tons of steel wire, 27 tons of steel bars, 6 tons of steel forgings and 1 ton of steel rods from Sweden.

Scrap in Further Rise at St. Louis

ST. LOUIS, Aug. 13.—Prices of scrap in the St. Louis market were stepped up again this week as the result of the sale of 3000 to 4000 tons of rails and specialties to an East Side melter and growing strength in outside markets. The order referred to was divided among several dealers, and is for delivery over the next 60 to 90 days. Miscellaneous standard-section rails and rails for rolling are 50c. a ton higher, railroad springs and No. 2 railroad wrought are 75c. a ton up, and steel rails less than 3 ft. are $1 a ton up. The Louisville & Nashville has issued a list of 39,000 tons of scrap, but it is not expected that any of this material will go to this market. The Missouri Pacific has a list of 100 carloads.

Orders for finished iron and steel are coming in fairly well considering that a summer slump had been expected, and business is said to be better than had been thought possible. The State of Missouri recently rejected bids for highway bridges that would have required 1075 tons of structural steel. Warehouse business so far in August is equal to the same period in July, which was approximately 20 per cent of the same month in 1934. Because orders are being held up, the seven large steel fabricating plants in the district have cut their operations to an average of 25 per cent, ranging from 5 per cent to 50 per cent of capacity.

Shipments of pig iron are said to be keeping abreast of last month's movement, and the melt in the Belleville stove district and among agricultural plants is better than usual at this time of year. Orders continue only for immediate requirements.

Steel Demand Lags In New York District

Tin Plate Orders Show Moderate Pickup but Construction and Railroad Buying Remain at Depressed Levels

NEW YORK, Aug. 13. — Tin plate orders have picked up somewhat, but on the whole steel business in this sector is lagging behind the rest of the country. The local situation, however, is not without its encouraging features. Makers of heavy machinery have the best outlook in five years and in many cases must buy new machine tools, as well as steel and castings, to execute their orders. Outside of the 1936 Navy program, including 13 vessels on which bids have just been taken from private yards and 11 vessels for construction in Government yards, there is relatively little public work before the trade. The new Federal works relief program is unusually slow in getting under way. Among contemplated Federal-financed jobs in this area is the reconstruction of the Manhattan terminus of the Brooklyn bridge. Steel requirements have not yet been estimated.

Woodcrest Construction Co., New York, is low bidder on the depressed roadway approach to the Triborough bridge, requiring about 4000 tons of steel. New bids may be taken soon by the Board of Transportation, New York, on the first section of the projected Sixth Avenue subway, Manhattan, between Fortieth and Forty-fifth Streets. Tenders were originally asked about five years ago, but the project was then indefinitely postponed.

Efforts are being made to stabilize the resale price situation. In connection with reinforcing bars and fabricated structural steel it is reported that subsidiaries of mills, which heretofore at times have passed their losses on to the parent companies, will now be required to stand on their own feet. Pipe resale prices in this district are still very irregular. One reason for this is that the difference between mill prices and resale quotations has been wide enough to encourage the passing on of part of the margin to the ultimate buyer. A suggested remedy that is under consideration is to cut the resale discount 10 points or about 12 per cent. A considerable part of current pipe business here is for domestic oil burner installations.

The sheet market is lacking in volume and so far as galvanized finish is concerned most current business is in seconds.

Railroad buying continues to lag. The car repair shops of one of the largest roads remain closed, and its monthly steel requisitions are so small as to be almost ridiculous.

Reciprocity is almost as big a factor in selling steel as was the case under the code regime. With mill prices holding all along the line, buyers are placing business so far as possible with mills that buy from them.

Foreign trade is disturbed by currency complications. American mills have not only been at a disadvantage in competing in outside markets with Belgium, which recently devaluated its currency, but also with Germany, which is making special exchange arrangements in certain countries. The "coffee mark" in Brazil, for example, makes it possible for steel buyers in that country to take advantage of the "official" exchange rate, whereas in buying from the United States or Great Britain they can obtain official exchange only on 25 per cent of their purchases. The international pipe cartel is still in suspension pending the settlement of a quota dispute between Germany and France arising out of the return of the Saar territory to the former country.

Pig Iron

Furnace representatives are encouraged by a slight rise in foundry activity, and report an improvement in the volume of orders coming in each day. Total bookings of all district sellers amounted to 2800 tons last week, as compared with 1550 tons a week earlier and 1650 tons booked in the period a fortnight ago. Current demand is not confined to any particular industry but is made up of small orders from a wide variety of sources. It is reported that both Dutch and Russian irons are being offered as much as $3 under the level of domestic brands.

Reinforcing Steel

Miscellaneous ordering has improved, and there are several very attractive tonnages due to be placed in the next few weeks. New York State is taking bids Sept. 13 on a sizable tonnage of bars and mesh, and tenders will be taken some time in September on about 300 tons for the first section of the Sixth Avenue subway, New

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York. Woodcrest Construction Co., New York, will soon place 1700 tons for the Queens connection to the Triborough Bridge, and McElroy & Kerwin are expected to purchase 1500 tons shortly for grade crossings on Staten Island, N. Y.

Scrap

Heavy shipments of No. 2 steel continue to leave nearby Jersey points for Conshohocken and Pencoyd, Pa. In the immediate New York area, however, the market is still primarily export, and domestic prices in the West have not risen sufficiently high to attract material. Brokers continue to pay $8.50 and $7.50 for No. 1 and No. 2 steel respectively, for truck lots alongside barge. However, higher prices are occasionally available for larger amounts of desirable steel. Although the Japanese have again displayed some interest in the market in the Philadelphia-Baltimore area, no new business has been placed here. In fact, shipments are still being held up on some orders already on brokers' books. Italian deliveries are going forward slowly as payments come through in advance.

For the first six months of 1935, about 1,154,226 tons of scrap left this country. New York was the principal port of shipment, with 267,902 tons loaded. In this total are included 5793 tons of tin plate scrap and 4628 tons of waste waste tin plate, the remainder being iron and steel scrap.

OBITUARY

ROBERT M. KILGORE, New York district sales manager for Jones & Laughlin Steel Corpn., died at Montclair, N. J., on Aug. 7. He was born in Allegheny, Pa., now part of Pittsburgh, on Jan. 14, 1877, and spent his early life in Blairsville, Pa., and attended Pennsylvania State College. He spent his entire business career with the Jones & Laughlin company, starting in the hot-rolled sales department on June 27, 1898. He was made district sales manager of the Cleveland office in January, 1908. On Jan. 20, 1919, he was made assistant sales manager of the hot-rolled sales department at Pittsburgh, holding that position until he was appointed New York district sales manager on Feb. 24, 1921. He was a member of the American Iron and Steel Institute, the New York Railway Club, and the Cloud Club.

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PAUL J. KALMAN, chairman of Bliss & Laughlin Co. and of the Globe Steel Tubes Co., died at his home at White Bear Lake, Minn., on Aug. 9. He was born in New York, April 1, 1879, and attended St. Paul Academy at Worcester, Mass. He was employed from 1897 to 1901 by the Chicago Great Western Railroad Co., and later organized the Paul J. Kalman Co. In 1931 the company was sold to the Bethlehem Steel Corpn. Mr. Kalman organized a number of companies, among them the Twin City Motor Car Co., the Kalman Floor Co., and the Hudson Motor Car Co. of Illinois.

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RICHARD BAHMANN, former president of Blymyer Iron Works and the Cincinnati Bell Foundry Co., died in Cincinnati, last week, aged 74 years. He had retired from business in 1925.

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CHARLES B. THORNE, assistant chief engineer, Arthur G. McKee & Co., Cleveland, was killed by an electric shock on July 31, while inspecting a gas washer at the Buffalo plant of the Republic Steel Corpn. He was 45 years of age and had been identified with the McKee organization for 10 years.

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OSCAR J. SHAFER, one of the oldest pattern manufacturers in Cincinnati, died at his home in that city on July 1, aged 78 years. Mr. Shafer founded the O. J. Shafer Pattern Works, Inc., in 1883. At the time of his death he was president of the company. He was one of the first members of the Cincinnati branch of the National Metal Trades Association.

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LEONARD W. WHITMORE, president of the Whitmore Machine & Foundry Co., and treasurer of the International Wire Works Co., Menasha, Wis., died July 29 of a heart attack while preparing to return from a week's outing at Fish Creek, Wis. He was 66 years of age and was co-founder of the Sailer-Whitmore Co., Menasha, formed in 1910, to manufacture paper and pulp mill machinery. Later he acquired the major interest. Mr. Whitmore originated numerous important mechanical devices in his field. He was a member of the Menasha board of vocational education from its inception.

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WILLIAM GATES, secretary, H. C. Frick Coke Co., Pittsburgh, died at his home in that city on July 30. Mr. Gates had been prominently identified with the fuel industry for many years. Born in Kittanning, Pa., he attended Lehigh University, and shortly after his graduation he joined the Frick company. Through the period of the company's expansion he worked his way up to executive positions.

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DR. A. D. LITTLE, chairman of Arthur D. Little, Inc., Boston, died on Aug. 1.

Activities Bearing On Machine Tools Distribution

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o o o

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On the Way Out

In practically every area of machine tool dealer coverage, July featured total order results which were not forecast by developments during the first 10 days of the month. As to comparisons with previous months of the year, July business rated well with very few exceptions. In some cases it was the best month of the year. In others, the total business equaled the best previous month, while a considerable number of reports refer to July as the second best month.

Chicago and Detroit areas "knocked over some good ones."

In the *Metropolitan area* there was "quite a run," as one dealer puts it, on radials, brakes and stamping equipment.

Pittsburgh area reports relative satisfaction with July orders and sends in optimistic opinions as to the balance of the year.

Orders, it is generally reported, covered a wider range of tool types and capacities than any previous month. The "spotty" order condition was decidedly less marked in all areas.

Radial drills, boring machines, millers, screw machines, and sheet-metal equipment were among the July favorites. Various styles of presses and second-operation machines seemingly outdid previous months in total volume. The call for small tools and miscellaneous attachments continued upward on the definite trend established during the preceding 60 days.

The first consistent evidence of "orders held up until after the Cleveland show" made its appearance. This is reported to have resulted in releasing a number of machine reservations. The reasonable deliveries made available by these releases were effective in closing other prospective orders which were hanging fire. While competition for automotive business is still very active, that industry is no longer the focal point for all sales activity.

Shortage of good operating mechanics is a general problem, as indicated by dealer reports of conversations with shop-operating executives.

July demand for, and inquiries concerning, gages, instruments, and control mechanisms is indicative of active preparations for increased speed and accuracy in production lines of equipment, as these lines are put back to work. The utility of cemented carbide tools received much July attention. The die-casting industry is reported as well pleased with comparative orders and inquiries.

The present machine-tool-equipment awakening from depression production is peculiar in this respect. Heretofore there has been much throwing out of chests and mentioning of order-source names, as orders have begun to materialize. Not so with this "recovery." To the contrary, constant warning persists that "names must not be mentioned" and that any stated volume of business on hand must be off the record. There seems to be no particular reason for this machine-tool modesty unless it may be, as one manufacturer puts it, "every time we hold our heads up we must expect some kind of a tax-sock on the chin."

Delivery has taken its predicted place as one of *the* important elements in favor of immediate order placing. Foreign interest in American tools is illustrated by almost daily announcements of additions to the prospective list of foreign visitors who anticipate being in Cleveland, Sept. 11-21, for the machine tool show. There the cream of American machine tool ingenuity will be on display and under demonstration.

With July normally a slow machine tool month, and with the Cleveland show in the almost immediate offing, it can be said that July orders indicate that we are returning to orderly machine-conscious paths with a stride of confidence which is causing the politically minded a lot of anxiety in trying to find new tricks in the old political trick-bag.

* * *

A Good Suggestion

From *Missouri* we have the following: "We are getting some nice business and will be in Cleveland, Sept. 11-21, for the machine tool show. We have quite a number of small-shop fellows coming along. You ought to make a point, in the machine tool activities column, that the show is as much for the little fellow and the medium-sized shop as it is for the large manufacturer. Some of those Washington fellows, too, might get a real inspiration at Cleveland, if they

Wire Your Congressman!

If forge shop profits are not what they should be, you certainly have just cause for complaint, and are entitled to wire your protest to your senator or representative, if you think it will do any good.

The more sensible course, however, is to wire us to send *our* representative with information on the savings you can make with modern Erie Forge Shop Machinery. You can't expect to make money operating hammers and presses fifteen or twenty years old, that have been written off your books long ago.

The forging industry cannot lift itself by its bootstraps through legislative enactments, constitutional or otherwise—but you can lift your shop above the average by replacing obsolete hammers with accurate economical ERIES.

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could fix it up to get off long enough to take in the show."

* * *

Japan

Metropolitan friends of Walter Lotz, Imperial Hotel, Tokio, Japan, report him as enjoying marked satisfaction in his work as Japanese representative of a number of American machine tool builders. Mr. Lotz was with Kearney & Trecker Corpn., Milwaukee, for a number of years. At the expiration of a three months' trip to Japan he returned to the United States and worked out plans whereby in March, 1935, he returned to Tokio to take up his permanent duties as a direct representative.

* * *

Regal Machinery Co., Osaka, Japan, has been organized for the purpose of carrying on an export business in Japanese machine tools. The president of the new company, Y. Nakagawa, has visited the United States several times, making observations in connection with proposed distribution policies. An additional trip is planned for the near future, during which presentations of the Japanese products will be made and selling arrangements entered into.

* * *

Labor Shortage

Several interesting viewpoints as to skilled labor shortage in mechanical fields are at hand and are deserving of attention. A mechanic, member of Structural Steel Workers Union, writes: "Years ago we had only 15 per cent of male population who had a college education. The result was that the 15 per cent controlled the remaining 85 per cent, and used them as they saw fit for their own profit. Today the matter is reversed and we have 85 per cent who have high school or college education. That leaves only 15 per cent for them to work on, with the result that there are not enough suckers to go around and you have a shortage of skilled labor." Apropos of this, our attention is called to the following question and answer at a Roger Babson lecture some time ago. Q. "When will we have more equality in the wages paid to working men?" A. "When our fond mothers and fathers realize that it is more honorable to be a good mechanic than a poor clerk will the wage question solve itself." Among the notes of a social investigator we find a father saying: "Why should I send him to a trade school and make a mechanic of him? The Government has got to support him." From any one of these viewpoints, it is still evident that machine tools must fill the gap between available mechanical ability and that which might be used.

A BOOKLET on "The Metallurgy of Oxy-Acetylene Welding of Steel," by J. H. Critchett, vce-president, Union Carbide and Carbon Research Laboratories, Inc., has been issued by the Linde Air Products Co., 30 East Forty-second Street, New York. It discusses the physical and chemical principles involved in the oxy-acetylene welding of steel. The author compares by analogy the metallurgy of open hearth practice with that of steel welding, the study, therefore, covering physical changes such as expansion and contraction, metallurgical effects such as crystallization, heat-treatment and the effect of alloys, and the chemical reactions of steel with its surrounding materials. The discussion includes metallurgical factors which led to the development of modern welding rods and of the carburizing flame technique for welding steel.

Finishing Motion Picture Cameras and Projectors

(CONTINUED FROM PAGE 19)

of that period the castings are removed from the oven, placed in a cold oven which is slowly fired to raise the temperature to 350 deg. F. in an hour's time. That heat is held one half hour and then the castings are allowed to cool in the oven.

Color Is Obtained With Lacquer Spray

The next operation is to inspect all castings, remove excess enamel where it may have accumulated at casting edges, sand paper high spots and then lightly sand the entire surface. The under coating and the damaskene finishes have little to do with the final color finish. This is accomplished by spraying with lacquer. The Bell & Howell Co. finishes in two colors, black and a rich shade of brown or bronze. Black lacquer is used for black finish, and the bronze shade is obtained by adding antique statuary bronze powder to the black lacquer. Gray can be had by mixing aluminum powder in the black lacquer.

Parts requiring high gloss usually are made of sand castings which, after having been cleaned in the conventional way, are filled by the usual putty knife method. The filler coat is brushed on and the parts are placed in a cold oven and slowly heated to temperatures that range from 200 to 300 deg. F., depending on the weight of the casting. When cool, the parts are sanded and inspected for pin holes and defects which are filled. An under coat of enamel is then sprayed on, which is baked at 350 deg. F. When cool, it is sanded down and a second under coat is applied and baked. Another sanding and then the finish coat is applied. It is baked at 350 deg. On very high class work a second finish coat is applied. If high gloss is desired the two finish coats will be of high gloss enamel. Semi-gloss or rubber finish are determined by the characteristics of the enamel used for the finish coat.

All finish materials are applied by the spray method whenever practicable. However, some small lot parts are coated by brushing on the enamel.

MAKE THIS CONVINCING HAMMER TEST

Hard to believe that Roxalin's BLAX*, the one-coat, air-dry, no-primer finish won't chip, flake or peel under this terrific hammer-against-metal impact? Then make the test yourself. Convince yourself that BLAX* is so *tough*—so *flexible* that it can take this brutal abuse. Your products finished with it will take misuse in your customer's hands without complaint and stand assembling and fabricating operations in your shop without chipping. Send for FREE metal test strips and Bender Booklet that tell the story. Address your request to Dept. 800.

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*Also in colors.

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ROXALIN *Flexible* FINISHES

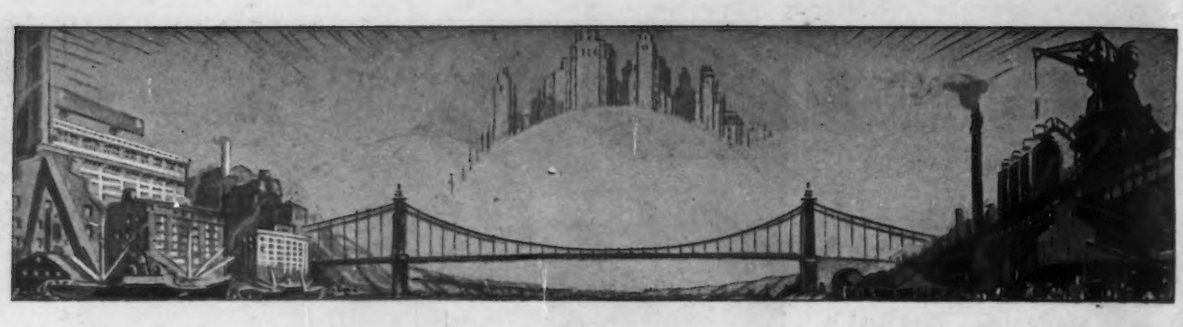
CELLULOSE & SYNTHETIC TYPES ENGINEERED FOR SPECIFIC PERFORMANCE

Valleys Are Third Among Steel Centers

RANKING third among the steel producing districts of the country, the Mahoning and Shenango Valley district in 1934 produced nearly 3,000,000 tons of steel ingots, more than 11.5 per cent of the nation's total production last year, according to the American Iron and Steel Institute. The district comprises Trumbull, Mahoning and Columbiana counties in Ohio, and Lawrence, Mercer and Venango counties in Pennsylvania.

Iron and steel products are preduced in 43 plants in the district, which last year employed 45,453 persons and paid out $46,250,370 in payrolls.

Capacity of the district's plants for producing for sale hot and cold-rolled strip steel, mechanical tubing and skelp (from which welded pipe is made) is greater than the capacity of any other district.



Plant Expansion and Equipment Buying

Future Outlook Mitigates Seasonal Tool Slowdown

MACHINE tool builders have every reason to be optimistic in spite of a present seasonal lull in the rate of bookings. Extensive rehabilitation plans, such as the $50,000,000 program of General Motors and increased tool buying by Amtorg, are but two of the recent reassuring indications which promise substantial activity this fall. September, with its Machine Tool Show at Cleveland, is expected to initiate a replacement demand that will keep tool building plants going at full speed during the remainder of this year and the months of 1936.

Meanwhile, tool building activity proceeds on a basis of approximately 40 per cent of capacity with single orders from foreign and domestic sources constituting the demand backlog.

NORTH ATLANTIC

Sucrest Corpn., 111 Wall Street, New York, recently organized subsidiary of American Molasses Co. of New York, same address, has begun erection of new four-story cane sugar refinery on Richard Street, Erie Basin, Brooklyn. Project will include power house, storage and distribution units, and other structures, occupying about six acres. Cost over $400,000 with equipment. Charles W. Taussig is head.

F. E. Schundler & Co., 49-15 Vernon Boulevard, Long Island City, manufacturer of magnesite products, paint pigments, etc., plans rebuilding part of plant recently destroyed by fire. Loss about $70,000 with equipment. Headquarters are at Joliet, Ill.

American Can Co., 230 Park Avenue, New York, has leased one-story factory at 107-115 Avenue L, Newark, N. J., totaling about 65,000 sq. ft. floor space, for new plant. This will be third plant for company in Newark, others being located on Elizabeth Avenue and McWhorter Street.

Central School District, Whitney Point, N. Y., plans manual training department in new two-story high and grade school. Cost over $325,000 with equipment. A. F. Gilbert, 358 Fifth Avenue, and George P. Bender, 120 Broadway, both New York, are architect and consulting engineer respectively.

Poloron Electric Mfg. Corpn., 26 Waverly Place, New York, manufacturer of electrical equipment, has leased space in building at 599 Eleventh Avenue for new plant.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Aug. 20 for engine lathes and spare parts (Schedule 5705); until Aug. 23, seven tube rectifier equipments and spare parts for portable battery charging (Schedule 5710); until Aug. 27, 14 electric-operated boat-handling capstans and spare parts (Schedule 5737), for Brooklyn, Philadelphia and Charleston, S. C., navy yards.

Village Council, Valatie, N. Y., plans new municipal electric light and power plant and electrical distributing lines; also one-story equipment storage and distributing building. Fund of $109,000 has been secured through Federal aid.

Board of Education, City Hall, Utica, N. Y., plans manual training department in new two-story senior high school, for which bids have been asked on general contract. Fund of $850,000 has been arranged for building and equipment. Bagg & Newkirk, United Gas & Electric Building, are architects.

United States Engineer Office, First District, New York, asks bids until Aug. 20 for forged steel propeller tail shafts and steel shaft sleeves (Circular 37).

Contracting Officer, Air Corps, Naval Air Station, Lakehurst, N. J., is securing appropriation of $317,000 for extensions and improvements, including new buildings, railroad trackage, shop facilities and other mechanical work. A total fund of $1,300,000 is being arranged for other structures, station and mechanical facilities. Lieut.-Commander Ira P. Griffen, Naval Civil Engineer Corps, is project manager.

State Purchase Commissioner, State House, Trenton, N. J., asks bids until Aug. 19 for steel furniture.

Borough Council, Vineland, N. J., plans new municipal electric light and power plant, including turbo-generator unit and accessories, boilers, stokers, pumping machinery and auxiliaries, spray pond equipment, etc. Fund of about $600,000 is being arranged through Federal aid. Scofield Engineering Co., Commercial Trust Building Philadelphia, is consulting engineer.

Commanding Officer, Frankford Arsenal, Philadelphia, asks bids until Aug. 19 for one complete multiple-spindle automatic screw machine (Circular 69).

Supply Officer, Naval Aircraft Factory, Navy Yard, Philadelphia, asks bids until Aug. 20 for chisels, hammers, files, screwdrivers, wrenches and other tools (Aero Req. 576), 40 tail wheels and 25 tail skid wheel assemblies (Aero Req. 5½-B), brass shut-off cocks (Aero Req. 526), 50,000 ft. high-tension ignition cable and 147,300 ft. low-tension electric cable (Aero Req. 611), axles, wheels, chains, elevators, stabilizers, screws, cowlings, oil piping, cable and other airplane parts (Aero Req. 5½-A).

Keystone Auto Body Co., 2325 Fairmount Avenue, Philadelphia, has leased building at 1411-17 Spring Garden Street, about 13,000 sq. ft. floor space, and adjoining structure at 412-18 Brandywine Street for new works.

Purchasing and Contracting Officer, Air Corps, Middletown Air Depot, Middletown, Pa., asks bids until Sept. 2 for one 3-ton electric bridge crane, one 10-ton electric traveling crane, one 5-ton electric crane, six 10-ton electric hoists, 20 3-ton electric trolleys, three 1-ton electric hoists, and one elevator hoist (Circular 2).

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Aug. 20 for 25,000 ft. of arc-welding insulated electric cable for Philadelphia Navy Yard (Schedule 5732).

Commanding Officer, Navy Yard, Philadelphia, plans new heavy machinery storage and distributing building at yard. Fund of $600,000 is being arranged for building and equipment, including cranes, hoists and other mechanical-handling equipment.

Quartermaster Depot, Twenty-first and Johnston Streets, Philadelphia, asks bids until Aug. 26 for 9,450,000 nickel-plated brass eyelets, etc. (Circular 41).

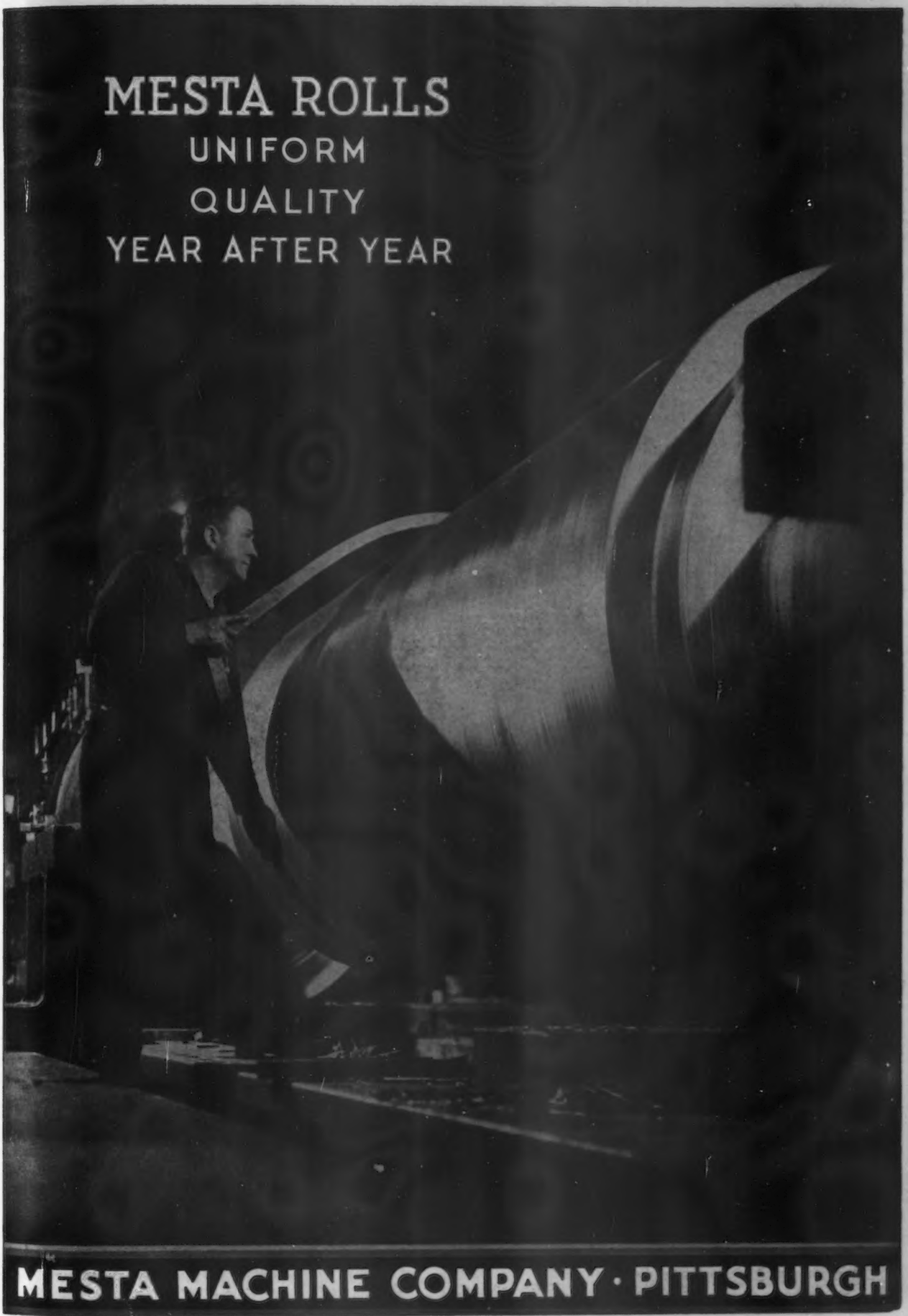
NEW ENGLAND

Dawson's Brewery, Inc., New Bedford, Mass., plans one-story addition and installation of new equipment. Cost over $40,000 with machinery. William Tallman, 222 Union Street, is architect. Mark Linenthal, 250 Devonshire Street, Boston, is consulting engineer.

Board of Education, Norwalk, Conn., Dr. George W. Fawcett, chairman, plans installation of manual training equipment in new two-story senior high school. Cost about $900,000, of which portion will be secured through Federal aid. James Burley and William Tooker, Norwalk, are associated architects.

Colfax Packing Co., 34 Colfax Street, Pawtucket, R. I., food packer, has let general contract to J. P. Flynn, 112 Lenox Avenue, Providence, R. I., for one-story and basement addition, 40 x 75 ft. Cost about $30,000 with equipment.

Boston Elevated Railway Co., 31 St. James Avenue, Boston, has let general contract to Frankini Construction Co., 30 Mystic Avenue, Medford, Mass., for new one-story motor truck and equipment service, repair and garage building, 140 x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WORTHINGTON

155 ft. at Charleston. Cost about $85,000 with equipment.

Arthur J. Roux, Inc., Lowell, Mass., has been organized by Arthur J. Roux, 19 White Street, and associates, to manufacture sheet metal products.

New Departure Mfg. Co., Bristol, Conn., manufacturer of ball bearings, steel balls, etc., has let general contract to George J. LaCourse, George Street, for one-story addition. Cost about $25,000 with equipment.

WESTERN PA. DIST.

H. L. Lambert, Kanawha Hotel, Charleston, W. Va., is at head of project to operate a distillery at St. Albans, W. Va., where former plant of Roessler & Hasslacher Chemical Co., now operated by E. I. duPont deNemours & Co., Wilmington, Del., is being acquired. Structures will be remodeled for capacity of about 250 bbl. a day. Cost over $400,000 with machinery.

Molybdenum Corpn. of America, Inc., Grant Building, Pittsburgh, has let general contract to McConnell & Osburn, Inc., Canonsburg, Pa., for one-story addition to plant at Washington, Pa., for ore extraction service. Cost close to $30,000 with equipment.

Universal Lubricating Co., Allegheny Avenue, Oakmont, Pa., manufacturer of lubricating oils, etc., plans rebuilding part of plant recently destroyed by fire. Loss about $45,000 with equipment.

SOUTH CENTRAL

Board of Education, Newport, Ky., plans manual training department in new three-story and basement school, for which bids will be asked soon on general contract. Fund of $300,000 is being arranged through Federal aid for building and equipment. C. C. and S. K. Weber, 111 East Fourth Street, Cincinnati, are architects.

Knoxville Heating & Cooling Co., Inc., Knoxville, Tenn., plans new steam power plant on Tennessee River, for central heating service in commercial district, with adjoining station for central air-conditioning plant. Cost over $200,000 with equipment and pipe lines. Financing is being arranged through Federal aid. Harold A. Lynette is vice-president, in charge.

Nashville Roller Mills, Inc., 101 Taylor Street, Nashville, Tenn., plans new mill for flour-blending, storage and distribution at terminal site of Central of Georgia Railway, Savannah, Ga. It will be equipped for initial capacity of 500 bbl. a day, including conveying, loading and other mechanical-handling equipment. Cost about $55,000 with machinery.

Airport Committee, City Council, Nashville, Tenn., William T. Cheek, chairman, plans new municipal airport on Murfreesboro Road, recently acquired, to include hangars, with repair and reconditioning shops, oil storage and distributing buildings and other field units. Cost over $100,000 with equipment.

Henderson Brewery, Henderson, Ky., has been acquired by new interests, headed by John C. Worsham and associates. Plans are under way for extensions and improvements, including additional equipment.

OHIO AND INDIANA

River Raisin Paper Co., Monroe, Mich., has taken over property at Woodland Avenue, S. E., and East Ninety-third Street, Cleveland, totaling 40,000 sq. ft. floor space and will remodel for new paper converting mill, with storage and distributing facilities. Cost over $150,000 with equipment. James Hamilton, heretofore in charge of local branch, Park Building, will be plant manager.

H. S. Hanler Co., Cleveland, manufacturer of automobile equipment, has leased about 20,000 sq. ft. in factory at 2837 Prospect Avenue, S. E., for new local plant. It is expected to occupy entire structure later.

Toledo Fitting & Mfg. Co., Inc., Toledo, Ohio, recently organized, will operate a plant at East Broadway and line of Wheeling & Lake Erie Railroad, for manufacture of malleable iron pipe fittings and allied specialties. James C. Doyle is vice-president.

Electric Auto-Lite Co., Champlain and Mulberry Streets, Toledo, Ohio, plans expansion and improvements in plant of Central Brass & Fixture Co., Springfield, Ohio, recently acquired, manufacturer of automobile bumpers and kindred accessories. Buildings will be remodeled to develop output of about 4000 bumpers per day, or double present capacity. Cost close to $150,000 with machinery. Company has also acquired Alemite Die-Casting & Mfg. Co., manufacturer of die-castings, etc., with plants at 2640 Belmont Avenue, Chicago, and Woodstock, Ill., and will operate as a subsidiary, containing plants at present locations and increasing output.

Contracting Officer, Material Division, Air Corps, Wright Field, Dayton, Ohio, asks bids until Aug. 19 for non-climbable galvanized chain link fence (Circular 87); until Aug. 20 for 2325 6-in. diagonal cutting pliers (Circular 86); until Aug. 21, fire pumps and equipment (Circular 50); until Aug. 23, 400 voltameters (Circular 52), 590 wheel assemblies, 20 landing gear wheel assemblies, 30 tail-wheel assemblies, 60 brake assemblies (Circular 57), 950 belt assemblies (Circular 81), altimeter assemblies in lots of 800 to 1200 (Circular 46); until Aug. 26, 601,600 ft. extra flexible cable (Circular 63).

Hoosier Lamp & Stamping Corpn., 1511 Read Street, Evansville, Ind., manufacturer of metal stampings, metal lamps, parts, etc., has let general contract to Tri-State Contracting Co., 1525 Shanklin Avenue, for one-story addition, 38 x 120 ft. Cost close to $50,000 with equipment.

BUFFALO DISTRICT

Alco Products, Inc., Dunkirk, N. Y., a subsidiary of American Locomotive Co., New York, plans early removal of part of plant, primarily hammer shop and drop forge division, to works of parent organization at Schenectady, N. Y., where locomotive construction will be concentrated in future. Dunkirk plant will specialize in manufacture of oil refinery machinery and allied products.

Board of Education, Canisteo, N. Y., plans manual training department in new two-story school. Cost about $300,000. Financing is being arranged through Federal aid. R. A. Freeburg, 1107 West Third Street, is architect.

W. B. Milner & Sons Mfg. Co., Dunkirk, N. Y., manufacturer of valves, fittings, etc., plans expansion in capacity and will install new equipment in machine shop and metal-finishing department.

State Department of Public Works, State Office Building, Albany, N. Y., has purchased former plant of Multicell Radiator Corpn., 500 West Avenue, Lockport, N. Y., and will remodel for new district equipment storage and distributing building, service and garage unit.

WASHINGTON DIST.

Purchasing Officer, Department of Interior, Washington, asks bids until Aug. 19 for five gasoline-powered shovels and two 45-ft. boom draglines, various deliveries (Proposal 872); until Aug. 22, one 5-ton gasoline-power road roller for Lemont (Proposal 865).

Procurement Officer, Chemical Warfare Service, Edgewood Arsenal, Md., asks bids until Aug. 20 for 200 forgings (Circular 6).

Great Morgan Coal & Coke Corpn., care of H. W. Morgan, East Radford, Va., president, recently organized, plans installation of equipment for coal mining operations in Chesterfield County, near Richmond, Va., where more than 3000 acres have been leased. Elevating, conveying, hoisting, loading and other machinery will be provided. Financing in amount of $500,000 will be arranged, portion of fund to be used for purpose noted.

General Purchasing Officer, Panama Canal, Washington, asks bids until Aug. 26 for 20,000 lb. steel screw spikes, manhole covers, 13 dump-type motortruck bodies, electric cable, 20,000 ft. weatherproof wire, water gages, automobile jacks, wheelbarrows and other equipment (Schedule 3080); until Aug. 22, 67,000 lb. comcon wire nails, 18,600 lb. galvanized wire finishing nails, 22,000 ft. wire rope, 21,000 lb. soft steel wire, 3200 lb. boat spikes, 265 tackle blocks, 26 chain hoists, six portable forges, 150 rivet punches, 72 metal-cutting bandsaws, 39,000 ft. wire rope and other equipment (Schedule 3079).

Crown Cork & Seal Co., Inc., Eastern Avenue and Kresson Street, Baltimore,

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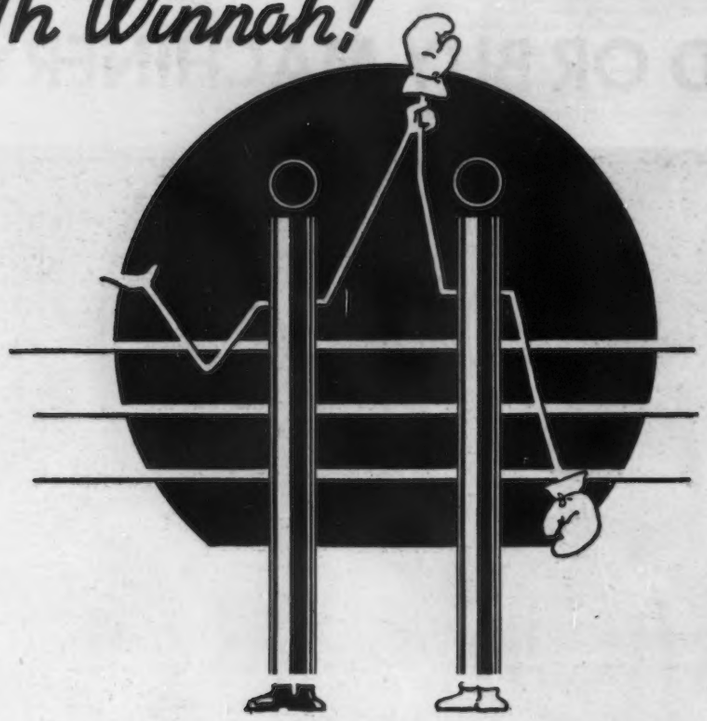

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They have the stamina and finish that go with extra fine cold finished steel. They uphold the B & L reputation for accuracy, straightness, concentricity and freedom from imperfections. They take the place of more expensive steels where special hardening properties are unnecessary.

Their mirror-like finish makes them ideal for exposed parts in precision machinery. Close fit in assembly is assured by tolerances of plus .000" minus .002", and plus or minus .00025" for special accuracy. Try these B & L Small Rounds on your next order.

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plans installation of equipment for new type of metal containers in one-story plant addition, for which superstructure is under way. Cost over $40,000 with machinery.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Aug. 20 for one 5-ton hand-operated I-beam crane (Schedule 5743).

SOUTH ATLANTIC

Board of City Commissioners, Spartanburg, S. C., plans new municipal hydroelectric generating plant on Pacolet River, near Rainbow Lake, to include transmission line to city, power switching and substation and distributing lines. Cost about $1,000,000. Financing is being arranged through Federal aid. Department of Public Works, Dr. L. McD. Kennedy, director, will be in charge.

B. F. Goodrich Co., Akron, Ohio, manufacturer of automobile tires and tubes, etc., has plans for new factory branch, storage and distributing plant at Miami, Fla. Cost over $65,000 with equipment. Local headquarters are at Seventh Street and Biscayne Boulevard.

Southern Brewing Co., Pierce and Zacky Streets, Tampa, Fla., plans extensions and improvements, including new mechanical bottling machinery and other equipment. Cost close to $45,000 with machinery.

Duke Power Co., Charlotte, N. C., plans extensions in transmission and distributing lines for service in rural districts, totaling over 400 miles, with substation, switching and service facilities. Permission has been secured for initial allotment of about 125 miles. Entire project will cost over $1,000,000.

MICHIGAN DISTRICT

Budd Wheel Co., 12141 Charlevoix Avenue, Detroit, manufacturer of steel automobile wheels, etc., has asked bids on general contract for one-story foundry unit. Cost over $30,000 with equipment.

Ottawa Industries, Inc., Grand Rapids, Mich., recently organized as a subsidiary of Michigan Bumper Co., same place, to manufacture automobile parts and fixtures, has acquired former plant of Ottawa Mfg. Co., Spring Lake, Mich., for new works. W. G. Vogel is vice-president and general manager.

Kalamazoo Stove Co., Kalamazoo, Mich., has begun erection of one-story foundry addition. Cost over $60,000 with equipment.

Michigan Brewing Co., Grand Rapids, Mich., has asked bids on general contract for extensions and improvements in main brewery units. Additional equipment will be installed. Cost close to $100,000 with machinery. Don Lakie, Grand Rapids, is architect.

Fisher Body Corpn., General Motors Building, Detroit, has purchased branch plant of Murray Corpn., Detroit, at Memphis, Tenn., including about 45 acre tract, for manufacture of automobile body parts. Improvements will be made in building and additional equipment installed. Cost over $100,000 with machinery.

MIDDLE WEST

E. Edelmann & Co., 2332 West Logan Boulevard, Chicago, manufacturers of automobile equipment, have let general contract to Rune & Sons, 6753 Stony Island Avenue, for two-story addition, 41 x 83 ft. Cost about $45,000 with equipment. David S. Klafter, 100 North La Salle Street, is architect.

Ideal Roller & Mfg. Co., 2512 West Twenty-fourth Street, Chicago, manufacturer of printers' rollers and kindred equipment, has let general contract to A. T. Herlin & Son, 6816 Clyde Avenue, for one-story addition, 50 x 108 ft. Cost about $35,000 with machinery. R. H. Maveety, 20 North Wacker Drive, is architect.

State Department of Administration and Finance, State Capitol Building, St. Paul, Minn., asks bids until Aug. 20 for new engine-generator unit and auxiliary equipment for power house at institution at Owatonna, Minn. G. M. Orr & Co., Baker Building, Minneapolis, are consulting engineers.

Commanding Officer, Fort Logan, Colo., plans new buildings and improvements in present structures and utilities, in connection with general modernization program, including new gasoline and oil storage and distributing building, with service, repair and garage unit adjoining, cost about $121,000 with equipment; expansion and improvements in equipment storage and distributing buildings, cost over $150,000 with equipment; improvements in water syatem, including new reservoir, pipe lines, etc. Appropriations are being arranged.

City Council, Muscatine, Iowa, plans new municipal hydroelectric power plant on Cedar River, with transmission lines to city, power substation and switching station, electrical distributing lines, etc. Cost about $3,000,000. Financing will be arranged through Federal aid.

Purchasing Officer, Department of Interior, Washington, asks bids until Aug. 19 for one ½-cu. yd. gasoline-operated dragline for Gillette, Wyo. (Proposal 863), one drilling machine, mounted on wagon for Milwaukee (Proposal 866); until Aug. 22, one ⅜-cu. yd. gasoline engine-operated shovel, one boom, one clamshell bucket, one dragline bucket and one trailer for LaPlant, S. D. (Proposal 898).

La Crosse County Board of Supervisors, La Crosse, Wis., has engaged Wells E.

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If you are like a great many other users of enameling sheets, you are looking for a distinctly better kind of enameling stock for use in drawn shapes. Granite City Steel Company announces an improved sheet—particularly adapted for deep drawing operations and specially developed to minimize chipping and breaking.

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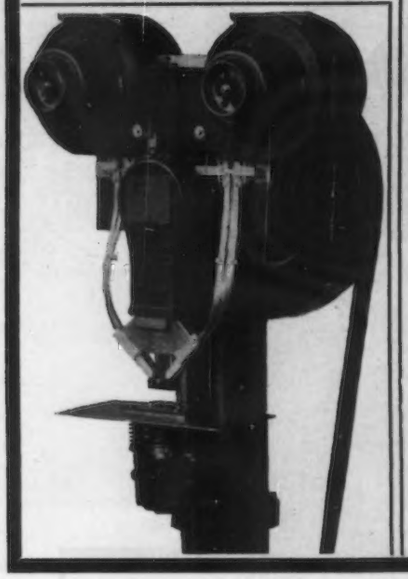
1502 Mariner Tower, Milwaukee

RIVETS TWO AT A TIME—



The Model AA Simplex Rivitor automatically feeds and sets two solid rivets in one operation. It handles solid, tubular or split rivets, to and including 3/16" diameter, in various lengths and heads. Positive selectors assure rivets at every operation. Dependable hoppers supply an ample amount of rivets. A safety clutch removes the danger of repeating.

Let us submit samples of your work done in the "Rivitor" method

TOMKINS-JOHNSON CO.
628 North Mechanic St.
Jackson, Michigan

Bennett, local architect, to design new County highway department service and storage building, 80 x 200 ft., with wing, 80 x 100 ft., to cost with equipment about $75,000 and to be built as PWA project. Frank J. Davy is County highway commissioner.

SOUTHWEST

Crossett Lumber Co., Crossett, Ark., has plans for new pulp and paper mill for initial capacity of about 100 tons of finished paper a day. Power house, machine shop and other mechanical departments will be installed. Company will also develop timber properties for raw material supply. Fund of $4,000,000 has been secured from RFC to carry out project.

Common Council, Luxora, Ark., plans new municipal electric light and power plant, with electrical distributing lines. Cost about $78,000. Financing is being arranged through Federal aid. Moody & Co., National Standard Building, Little Rock, Ark., are consulting engineers.

Construction Service, Veterans' Administration, Washington, asks bids until Aug. 20 for new boilers, stokers and auxiliary equipment for power house at Jefferson Barracks, Mo.

J. B. Klein Iron & Foundry Co., 1439 West Third Street, Oklahoma City, Okla., has plans for one-story addition, 38 x 140 ft., for which superstructure will begin in September. Cost about $25,000 with equipment.

Purchasing Officer, Department of Interior, Washington, asks bids until Sept. 5 for two Diesel engine-driven electric alternators with direct-connected exciters, two air compressors, two air storage tanks, one 275-gal. fuel oil tank, pumping machinery and auxiliary equipment for electric power plant for Navajo Capital station, N. M. (Proposal 897).

Board of Education, 410 South Cincinnati Street, Tulsa, Okla., plans manual training department in new three-story and basement senior high school in East Side district. Cost about $1,000,000 with equipment. Financing is being arranged through Federal aid. Leon Senter, Philtower Building, and Joseph R. Koberling, 569 South Peoria Street, are architects.

Board of Public Works, Fort Worth, Tex., plans extensions and improvements in municipal waterworks, including four 500,000-gal. elevated steel tanks, pumping machinery with rating of about 15,000,000 gal. per day, improvements in Holly pumping station and new pipe lines. Fund of $800,000 is being appropriated for entire project.

PACIFIC COAST

Rainier Pulp & Paper Co., 343 Sansome Street, San Francisco, plans additions to mill at Shelton, Wash., including digester building and new caustic tank units. Cost over $80,000 with equipment. Plans have been approved for new one-story technical laboratory and test building, 46 x 172 ft. Cost about $45,000 with equipment.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Aug. 23 for pistons for controller pitch propeller and 20 landing gear ends, retrieving strut clevis for airplanes (Schedule 900-8692), for San Diego Naval Station; until Aug. 20, eight oxy-acetylene cutting and welding outfits (Schedule 5714); until Aug. 27, 300 pneumatic scaling hammers (Schedule 5724), for Mare Island Navy Yard; 10 motor-generators, 10 control panels and spare parts (Schedule 5727), for Mare Island and Portsmouth yards.

Carbon Dioxide Co., Seattle, care of Andrew Willatsen, Alaska Building, architect, has plans for new works at Wilmington, Utah, for production of industrial chemical specialties, carbon dioxide, etc., on site recently selected, with power house and machine shop. Cost over $65,000 with equipment.

Bureau of Reclamation, Denver, asks bids until Aug. 26 for three radial gates, 17 x 17 ft., and miscellaneous iron and metal work and equipment for spillway and outlet works, Pine View Dam, Ogden River Project, Utah (Specification 712-D); until Aug. 29, three motor-driven, double-drum, radial gate hoists, two 4 x 5 ft. and one 5 x 6 ft., high-pressure gates, with hydraulic hoists, gate hangers, conduit linings, etc., same project (Specification 714-D).

Themador Electric Mfg. Co., 2819 East Pico Boulevard, Los Angeles, manufacturer of electric specialties, has plans for new one-story factory. Cost close to $40,000 with equipment.

Bureau of Reclamation, Denver, asks bids until Aug. 22 for following equipment for Boulder power plant, Boulder Canyon Project, Arizona-California-Nevada: Until Aug. 22, two power distribution and control cabinets (Specification 709-D); until Aug. 23, one relay board for 287.5-kv. switchyard (Specification 710-D); until Aug. 26, two bulkhead gate-lifting frames, one trash-rack lifting frame and cylinder gate hoist stem installation equipment (Specification 711-D); until Sept. 9, two 82,500-kv. vertical shaft a.c. generators (Specification 638), two vertical shaft, 115,000-hp. hydraulic turbines, and two governors with pumping equipment for regulating speed of turbines (Specification 639).

FOREIGN

Technicolor, Inc., 15 Broad Street, New York, manufacturer of color film products for motion picture service, has organized a British subsidiary under name of Technicolor, Ltd., London, England, with capital of £320,000 (about $1,600,000) to construct and operate a new film-manufacturing plant near last noted city. Cost over $400,000 with machinery. Dr. Herbert T. Kalmus is president of parent company.

South African Railways and Harbor Board, Administration Building, Johannesburg, South Africa, plans additions to locomotive and car shops, including one-story machine works, repair shop for locomotive tenders, wheel shop and other units. Cost about $300,000 with equipment.

Mutual Pulp & Paper Mills of Prince Rupert, Ltd., Prince Rupert, B. C., lately chartered, care of F. L. Buckley, 1030 Hamilton Street, Vancouver, B. C., representative, is arranging fund of about $5,000,000 for new bleached sulphite pulp and paper mills at Seal Cove, Prince Rupert, where site has been selected. Plant will consist of several large units, with power station, pumping plant, machine shop and other mechanical departments. Company will also develop timber properties on Queen Charlotte Island for raw material supply.

Financial Notes

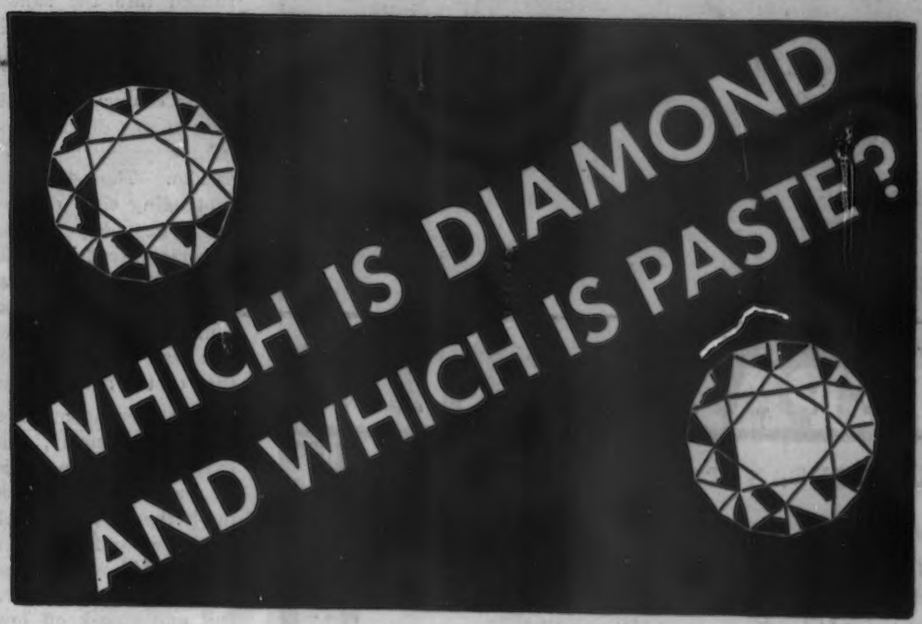
NATIONAL STEEL CORPN. reports net earnings for second quarter of $3,191,169, equivalent to $1.48 per share, compared with $2,593,369, or $1.20 in the June quarter of 1934. For the six months ending June 30, 1935, net earnings amounted to $6,558,802, equivalent to $3.04 per share on 2,155,777 shares of common stock outstanding. The earnings figure is after all charges, including taxes, depreciation, and interest, with the exception of a non-recurring, additional interest charge, incident to the bond refunding program just completed, of $242,807, which amounts to in excess of 11c. per share. The 1935 half-year earnings compare with $4,235,697, or $1.96 per share, earned in the first half of 1934.

• • •

WHEELING STEEL CORPN. and subsidiary companies report for the second quarter net income, after all charges for depreciation, depletion, interest and Federal taxes, of $668,300, compared with net income in the second quarter last year of $1,134,511. For the first half of the year, net profit amounted to $1,602,871, compared with $1,076,178 in the first six months of 1934.

• • •

CURTIS MFG. CO., manufacturers of air compressors, air hoists, cranes, automobile lifts, automobile car washers and tire-inflating stands, St. Louis, reports a net profit of $87,583 for the fiscal year ended May 31, compared with a net gain of $59,308 the preceding year.



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THERE'S JUST AS MUCH DIFFERENCE IN CLEANERS

Years of experience with all types and conditions of metal cleaning have enabled the makers of Wyandotte Metal Cleaners to develop specialized cleaners that will do more efficient work and save you money.

No matter what kind of work or type of equipment you have there is a Wyandotte Metal Cleaner that will help you solve your cleaning problem. One of the Wyandotte Service Representatives will be glad to demonstrate in your own plant how one of the Wyandotte Metal Cleaners is adapted to meet your requirements.

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Just "Chemically Clean"
Metal Cleaners

CAPACITIES: 1 TON TO 450 TONS

Overhead Traveling Crane Types: Floor or Cage Operated with single or twin hook, auxiliary hoist, extension, grab bucket, close clearance, or submerged trolley. Bulletins describing Shepard Niles Cranes and Hoists will be sent to you promptly on receipt of your request.

SHEPARD NILES CRANE & HOIST CORP.
356 Schuyler Avenue, Montour Falls, N. Y.

Change in Molding Method Reduces Cost of Lead Saucer Castings

(CONTINUED FROM PAGE 21)

ularly used on skin-dried work to eliminate the risk of burning the mold through a possible momentary carelessness.

Coremaking Simplified

The coremaking arrangements for the inside were made very simple by the employment of a pulley rim pattern. A pattern having a slightly larger inside diameter than the inner measurement of the pan casting was laid on a machined plate and lagged up inside to the correct width and depth, particular attention being given, of course, to the necessary contraction allowance for lead. In these cases the exact depth and diameter of the pulley rim pattern are of no particular consequence, as the inside lagging does the work, the pulley rim acting merely as a jig or template to hold the wooden strips in place, as shown in detail at Fig. 3.

Molded on an opensand bed, without the aid of a pattern, the core arbor, shown in Fig. 4, arranged for a three-point lift, was designed more with a view to its all-round utility on the varying diameters of the plans than with any pretense to beauty. The sprocket design of the grids gave a better grip on the sand, with less tendency to strip during handling, than would have been possible to attain with a smooth periphery.

The actual coremaking was thus greatly simplified, the pulley rim being laid on a flat plate, the wood lagging strips then stood up against its inner face, a thin layer of core sand spread all over the area inside the strips, the arbor casting claywashed all over and rubbed into the sand to a solid non-springing fit. A single course of sand was next rammed in and about the grating, its upper face in the center scraped bare, and a plug of any description—usually a smaller pulley pattern—set in the middle. The space between the protruding ends of the arbor and the large pulley rim was occupied to some extent by a single row of gaggers, leaning inward. These latter were only necessary, of course, when the diameter of the pan was considerably in excess of that of the arbor casting.

This arrangement served two purposes; namely, stiffening the base of the core, and permitting its easy removal when "slackening" the job after the casting solidified, to facilitate contraction. When, following these preparations, the interior was rammed full and struck off level with the tops of the lagging strips, the plug was drawn out first, then the outer pulley rim, the lagging strips, thus left bare, being next pulled away, tied into a bundle, and stored until again required.

The core was now slicked, blackwashed, and oven dried at the usual temperature of approximately 450 deg. F. The lower edge, intended to form the inside fillet, was rounded with a file, after drying, and on removal of the core from the plate. At this time, also, the entire lower face of the core was touched up and blackwashed while suspended from the crane, reasonably hot, and, when possible, immediately before assembly. This latter desirable feature prevented extra lifting, lowering, and possible disturbance of the core's smooth skin.

Steps in Closing the Molds

As the first step toward closing the mold, the outer face of the branch flange was covered with a cake core, perforated to permit the branch core to be passed through from the outside, and gaged to project 2⅞ in. past the outer wall of the mold. A fin ⅛ in. thick was thereby allowed for and risk of core breakage when lowering the heavy body section to place was thus eliminated. As indicated in the lower sketch of the assembled

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Quantity production facilities, under experienced supervision, are now ready to serve you.

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TYPE "G"

Self-Opening

DIE HEAD

The Murchey Type "G" is a self-opening die head for stationery spindles, and it takes the same chasers as our rotating "C-O" die head—thus providing economical interchangeability.

Pull-off type with quick positive opening.
Die head parts hardened and ground.
Internal trip if desired.
May be used for right or left threads by merely changing chasers.
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Sizes 7/16" to 6".

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face, drained clear, leaving no necks or sprues to be sawed off. This allowed the runner box to be removed immediately after pouring the casting, clearing the full circumference so as to permit attention to be given to the local shrinkage as quickly as it developed, a bath of hot metal on an open fire ready for a man with a dipper ladle taking care of that detail. By this means a greater degree of homogeneity was obtained than formerly, when the shrink holes were of necessity filled up while the casting was cold.

The prophets of gloom, craning their necks for indifferent results, found out that they had "backed a loser," as the skin on the casting produced by this method was equal to that on those made in loam, and at a cut in total cost of production of approximately 50 per cent.

mold, Fig. 5, the projecting end or print of the branch core was rammed firmly round to assure its immobility when the metal was poured. A vent was carried from the end of the core vent diagonally to the floor level, as shown, mainly as a precaution against the formation of gas pockets in or near the branch.

Chaplets or studs in a casting of this type being naturally taboo, the body core was lowered into the mold on to a padding consisting of several thickness pieces of 3-in. lumber, its exact position being assured by the insertion of size sticks set vertically at intervals around the wall of the mold.

An empty shallow iron cope flask was next lowered over the core, mold and outer cheek frame. Hook bolts, passed through the flask bar spacings to connect with the three lifting loops cast in the core arbor, and projecting through fishplates placed across the flask bars, were then temporarily hand tightened. In the open space left in the center of the core by the withdrawal of the plug, packing, in the form of large washers, cast blocks and various nondescript but useful material which should be easily available in every jobbing foundry, was stacked up and wedged to the flask bars, the three hook bolts being afterwards drawn tight.

After marking the exact position or "lie" of the suspensory flask so as to guarantee its correct replacement, flask and core were hoisted away together, the thickness pieces removed from the bottom of the mold, and the job finally closed, being, then, in effect, a plain opensand mold. A 3000-lb. cheese-shaped weight, with one lifting loop cast in, was next placed on the center of the mold, packed up high enough to clear the projecting ends of the hook bolts, and a perforated dry sand runner box laid over the open mold to allow the molten lead, when poured, a straight drop to the bottom plate.

Metal Poured from Standard Ladle

Amid the direst forebodings and prognostications of evil results from such a plan of action, voiced by the brethren in the "loam end," who had lost a valued prerogative, the metal was poured at low temperature from a standard geared ladle, the 4000 lb. of material used being melted in a few minutes on a wood fire with low blast pressure, in a small cupola used for such emergencies.

As will be seen in the cross sectional view of the assembled mold at Fig. 5, the runner box, packed up an inch or so above the joint

Modernization of Niles Sheet Mill

(CONTINUED FROM PAGE 28)

Tool & Mfg. Co., New Bremen, Ohio. This has a capacity for shearing 300 tons per day in widths from 20 to 72 in.

In the reequipped pickling department there is a Mesta pickler and two combination scrubbing and drying units which are connected to three cold-rolling mills, one for black sheets, one for specialties and the third in a special enameling unit. With these, sheets are pickled, cleaned, dried and cold-rolled in one continuous operation.

Two Normalizing Furnaces

There are two gas-fired furnaces for normalizing, one a Flinn & Dreffein chain-type furnace 75 ft. long, and the second a Tate-Jones disk-type unit 156 ft. long. For box annealing a Radiant Tube type of gas furnace built by the Surface Combusion Co., Toledo, has been provided to reduce annealing time and cost, and to obtain a more uniform product. The complete furnace unit includes four bases and four inner covers, permitting the furnace to be kept in continuous operation as the inner covers

THE EVENT OF THE YEAR

in the Metal Industry!

EACH YEAR the leaders in the metal industry assemble in the Fall to attend the National Metal Congress and Exposition.

This year they will be in Chicago on September 30 when this great Show opens in the New International Amphitheatre.

In the course of more than forty technical and practical sessions they will bring news of the latest developments in the world of metals. More than seventy-five papers dealing with all the phases of production, selection, fabrication, inspection, treatment, welding and application of all kinds of metals, will be presented.

Be on hand to hear and join in the discussion of these valuable papers. It is your opportunity of the year to exchange ideas with the leaders in your industry.

In addition to these technical and practical sessions, there will be hundreds of exhibits, many of them in actual operation, where you will have opportunity to see and study the newest advances in materials, methods and equipment.

Without question, this is the most important annual event in the world of metals. You will get hundreds of new ideas at the technical sessions, at the exhibits, and from association with the leaders of your industry. Headquarters will be at The Palmer House. Make your reservations now directly to the hotel and plan to attend

THE NATIONAL METAL CONGRESS AND EXPOSITION

in the New International Amphitheatre, Chicago

SEPTEMBER 30, OCTOBER 1, 2, 3 AND 4

AMERICAN SOCIETY FOR METALS

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AMERICAN WELDING SOCIETY

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IRON AND STEEL DIVISION, A. I. M. E.

●

THE WIRE ASSOCIATION

●

Daily programs of the five cooperating Societies, list of exhibitors, and map of Chicago showing International Amphitheatre, Palmer House, and other points of interest, will be carried in "The Review", published in September. Mail the attached coupon now and a copy of this interesting paper will be sent to you as soon as it is off the press.

Mr. W. H. EISENMAN, Managing Director
National Metal Congress and Exposition
7016 Euclid Avenue, Cleveland, Ohio

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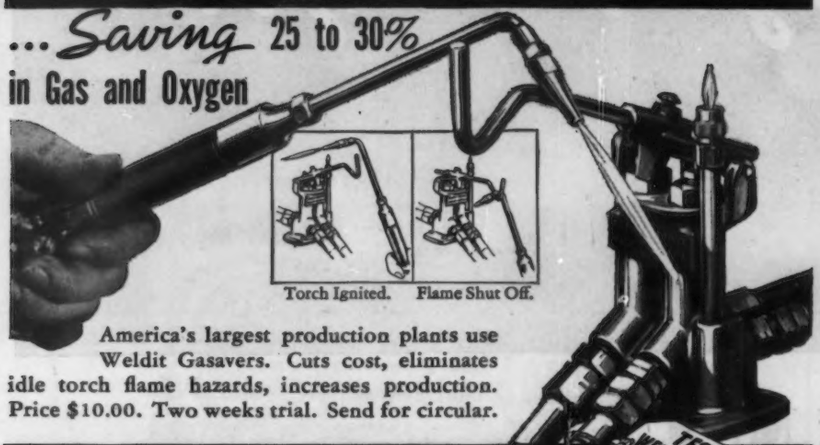

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take care of the cooling cycle. Furnace atmosphere is controlled by a Surface Combustion unit which converts raw natural gas into DX gas to give the product a more uniform surface in bright annealing. The new annealing furnace is supplemented by the old-type box annealing furnaces.

New galvanizing equipment will be installed shortly in a building now unused, providing ample floor space.

Henry A. Roemer, who has been identified with the sheet steel industry for over 35 years, is president of the Niles Rolling Mill Co., which is closely affiliated with the Sharon Steel Hoop Co., of which Mr. Roemer is also president, as well as of the Youngstown Pressed Steel Co., Warren, Ohio. Sheet bar for the Niles company will be supplied by the Lowellville Works of the Sharon Steel Hoop Co.

Other officers of the company are D. W. Frease, vice-president and general manager; M. C. Summers, vice-president in charge of sales; James A. Roemer, secretary and treasurer; E. G. Fenton, works manager; J. D. Neuman, manager of sales; Miss M. K. Huber, assistant secretary and in charge of purchases; and D. S. Smith, superintendent.

Bigness of Uncle Sam's Payroll

WHILE the New Deal swings the axe at bigness in business, and during the campaign assailed Federal bureaucracy with a promise to cut Government expenditures 25 per cent, during its 29-month tenure in office it added 154,225 civilians to the payroll, according to a personnel table for June issued by the Civil Service Commission. The increase in Washington alone was 36,000, making a total in the capital of 103,453. In the field, the total was 614,259, making an aggregate of 717,712 with a monthly payroll of $109,000,000 or at the rate of $1,311,600,000 a year! For good measure should be added 31,200 temporary employees in agricultural activities, not included in the regular tabulation, with a monthly payroll of $1,219,000.

The war-time peak of civilian employment for the country as a whole was in excess of 900,000. The increase of employees under the New Deal has been almost continuous, month by month, and while due chiefly to the setting up of alphabetical agencies, old-line departments also have seen increases. There has begun a cutting down in some of the agencies, including NRA, FACA, and the Railroad Retirement Board, due to Supreme Court decisions, the latter with only 24 employees being entirely abolished, but the payroll is not affected a great deal because of transfers to other departments.

Indeed the Government continues to grab every vacant property it can lay its hands on to house the horde of employees. Private houses, including mansions, have been rented, and now tenants in an apartment have been ordered to vacate to make room for Government employees. And it may be that the sacred precincts of the Washington monument and Lincoln memorial will yet be invaded.

Japanese Iron and Steel Production Gains

PIG iron produced in Japan in the first five months of the current year totaled 1,120,843 metric tons compared with 978,604 tons in the corresponding period of last year, an increase of 14 per cent. Ordinary carbon steel production totaled 1,879,158 tons in the first five months of 1935, reflecting a gain of 25 per cent, while output of all steel products amounted to 1,501,949 tons, an increase of 27 per cent. In reporting these figures, Trade Commissioner P. P. Steintorf, Tokyo, stated that the only decline was in rails and fish plates, attributed primarily to smaller requirements for railroad extension in Manchuria. The largest increases were in bars, sheets and shapes, but the most important relative gains were in tin plate, pipe and tubes.

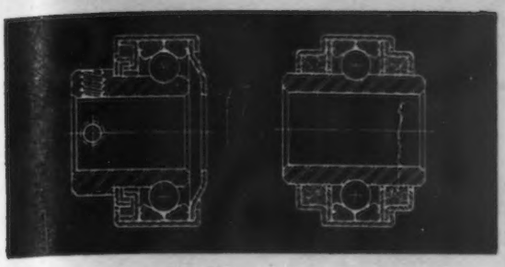
T. S. Gassner Co. Marks Eighty-Fifth Year

T. S. GASSNER CO., 152 West Apsley Street, Philadelphia, manufacturers of fabricated metal products, is celebrating its 85th continuous year of business service under that name.

Builders' sheet metal, alloy metal fabrication and stainless steel products are among the products of the plant.

Several months ago the Gassner company took over the making of the H. D. Dougherty Co. products, a concern that had been in business for many years and one that had produced most of the metal furniture and bedding for the largest hospitals and hotels throughout the East.

Maxwell R. Loechel has been president and treasurer of the concern since 1931. George B. Darby, Jr., is connected with both companies as general manager and purchasing agent.



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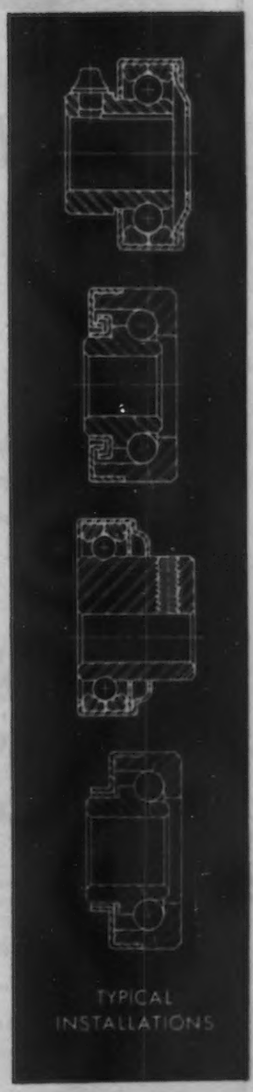

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For nearly half a century, we have had a reputation for delivering gears on time. Think what that means when you need a gear at a certain time and can be sure it will be in your hands when that hour arrives. Production schedules can be worked out and plans made for installing the gear.

The next time you need a gear of any type, specify Philadelphia.

Why not send for a copy of the "Gear Book" now. It contains all the information you need when ordering gears of any type.

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JUST BETWEEN US TWO

Duck Soup for Feed Man

WE will entertain complaints from cash customers with as good grace as possible, but when a non-subscriber starts criticizing us, our ire passes the berling point.

An Illinois manufacturer of "feeds for pigs and hogs" complains bitterly that the problems given here are too easy. Our disinterest in the pig and hog feed field is abysmal. We would shed no tears if every pig and hog feed man in the country declared, "I don't like The Iron Age."

But here is one pig and hog feed man who is apparently a constant reader. Either he is carousing nightly in the local public library or is fed up on the pig and hog feed business and is spending his time in the metal-working plant next door.

He is a brainy pig and hog feed man, for he says he did the king-prime minister problem in 39 seconds. We hope this one, submitted by C. H. Dutton of The C. H. Dutton Steel Stamp Co., Hartford, Conn., floors him:

"A fisherman was rowing up a stream. In the stream were two stakes one mile apart. As he passed the upper stake his hat dropped into the water. He let it go and continued rowing upstream for ten minutes. Then, remembering that his fishing license was in his hat, he turned around and rowed back, and caught up with his hat at the lower stake. How fast was the stream flowing? The man-power or rowing energy was constant."

But in Our Own Bailiwick . . .

ALTHOUGH we have probably only one reader in the great pig and hog feed industry, when we get in our own pasture, the metal-working field, the number of readers mounts precipitately.

For instance, a company selling to people who do welding asked its customers recently which business papers they liked best. Of a total of 1,047 replies, covering 14 papers, the first three received the following votes:

	Voted Indispensable by	*Read Closely by*	*Read Casually by*	*Total Votes*
The Iron Age	174	518	185	701
Second Paper	119	450	115	565
Third Paper	50	355	172	527

Pastel Perfection

A BELATED bouquet is tossed at Bethlehem Steel for the unusually pleasing use of color in its adv. on page 3 of the July 25 Iron Age.

They Didn't Jump at It

AN American engineer in the U.S.S.R. wrote us some months ago that he would like to receive literature from American manufacturers of steel mill equipment. A little item to that effect appeared in The Iron Age. Now he writes:

"I received little of definite use. American manufacturers either did not realize the potentialities of the Soviet market or did not want business from the Soviet state."

If you are interested, we will give you his name.

Fort Sumter Was Still Unshot

THE Michigan Wire Cloth Co., Detroit, established 1860, reminds us that it has been advertising in The Iron Age for nearly half a century. Is this our oldest advertiser?

Demand Your Rights

"THESE slips will aid considerably in getting the maximum value out of the information contained in The Iron Age."—E. J. Hull, President, Trabon Engineering Corpn., Cleveland.

Mr. Hull received 125 gummed routing forms, neatly printed with the name of his company and the names of the Trabon men who read The Iron Age each week.

The slips cost Mr. Hull nothing. Can you get a supply gratis? *Certainly!* There is no hook. We have been supplying these forms free, man and boy, for seventeen years. Send the list to us at 239 W. 39th St., New York.

Oberleutnant Has Soulmate

THE Oberleutnant has a twin soul in the oil well equipment manufacturing business in Pennsylvania. The twin soul writes:

"I don't like to use superlatives, but I believe with your book before me, I could eliminate all the rest."

—A. H. D.